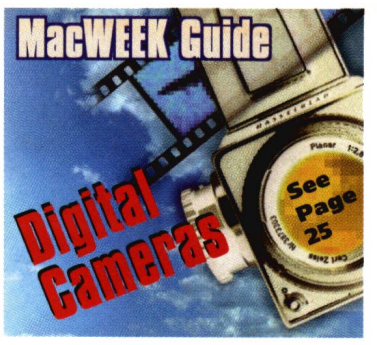
MacWEEK



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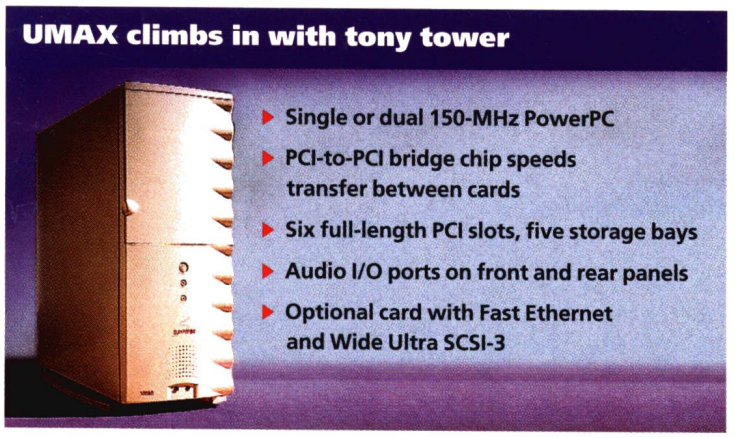

UMAX climbs in with tony tower
Single or dual 150-MHz PowerPC
PCI-to-PCI bridge chip speeds transfer between cards
Six full-length PCI slots, five storage bays
Audio I/O ports on front and rear panels
Optional card with Fast Ethernet and Wide Ultra SCSI-3

June debut for UMAX multiprocessor tower

By David Morgenstern

Chosen by Apple to drive the Mac OS in Taiwanese markets, UMAX Computer Corp. this week will complete its strategy flip-flop by releasing models of its six-slot PCI Mac clone in the United States. Volume shipments will begin in June, the company said.

UMAX's first machine will be the SuperMac S900L, a $3,995 system with a 150-MHz PowerPC 604 processor, six PCI slots, 512 Kbytes of Level 2 cache, 16 Mbytes of RAM soldered on the logic board, an Integrated Micro Solutions graphics card with 4 Mbytes of video RAM and a 2-Gbyte hard drive. The S900L will have eight DIMM slots, giving it

See UMAX, Page 83

Java to filter into Mac OS and OpenDoc

By MacWEEK staff

Sun Microsystems Inc. has just about accomplished its goal of Java ubiquity. At Spring Internet World 96 in San Jose, Calif., last week a string of operating system vendors, including Apple, said they had licensed Sun's programming language and would integrate it into their platforms.

Jim Gable, Apple vice president of system software product marketing, said Java will arrive on the Mac this year and will not be held for the Copland release now scheduled for mid-1997.

"People need to be reminded that all new system software is not Copland," Gable said.

Other companies in the latest round of licensees are Microsoft Corp., IBM Corp., Silicon Graph-

See Java, Page 82

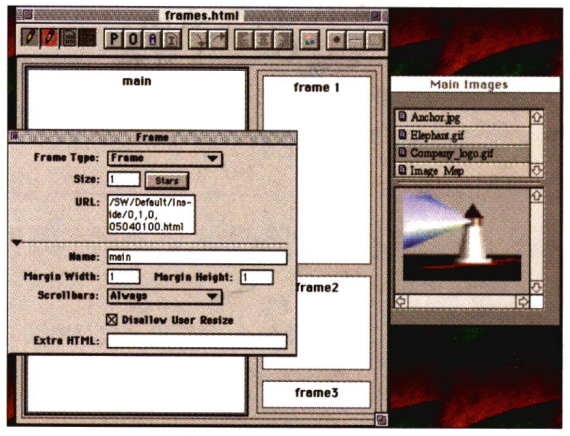
Loma Prieta app to rock PageMill

By James Staten

Hoping to follow in the footsteps of Ceneca Communications Inc., which struck gold with PageMill and drew the attention of Adobe Systems Inc., a small Silicon Valley company is privately showing a new cross-platform Web-page editor that borrows heavily from its role model but adds several new capabilities.

The program, code-named Loma Prieta, is a WYSIWYG HTML-authoring tool being developed by San Andreas Systems of Los Altos, Calif. According to sources, Loma Prieta will run on 680x0- and PowerPC-based Macs, and Microsoft Win-

See Loma Prieta, Page 85



Loma Prieta, a forthcoming cross-platform HTML editor, will create Web pages with Netscape Navigator frames. Users will also be able to embed Java applets into documents.

Dantz to step into Windows

By Henry Norr

Dantz Development Corp., long the dominant force in Macintosh backup software, is reportedly ready to make its long-delayed debut in the world of Intel-standard PCs.

Sources said Remote Pack for Windows 95/NT is slated to ship next month and will offer users of the two Microsoft Corp. operating systems the same automated network backup capabilities that Dantz's Retrospect Remote 3.0

See Dantz, Page 84

ScanView flatbed scanner to take shot at high end

By Matthew Rothenberg

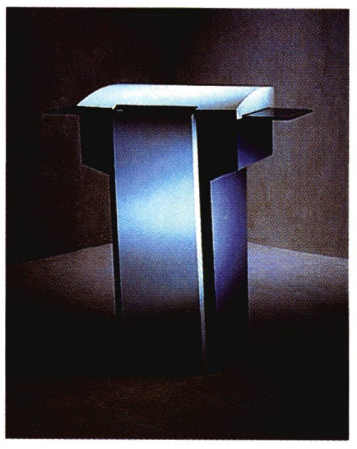
ScanView Inc. will move into the flatbed scanner market this month with a high-design, high-end model aimed at graphics professionals.

The ScanMate F8 marks ScanView's first foray into a segment of digital imaging staked out by Linotype-Hell Co. According to industry observers, it also confirms the ascendance of flatbed technology among pre-press users.

The ScanMate F8, priced at $39,995, uses an 8,640-pixel-wide trilinear CCD (charge-coupled device) array to capture transparencies and prints at an optical resolution of 4,000 dpi, ScanView said. It captures 16 bits each of RGB data per pixel in a single pass and features an optical density range of 3.7.

The device's optics include an adjustable-focus mechanism on

See ScanView, Page 82



The ScanMate F8 features a built-in light table and a straight optical path.

PowerBook pair due in fall after low-end laptop delay

PCI-based model aims for 200 MHz

By Joanna Pearlstein

Apple has reportedly delayed the introduction of Epic, its CD-ROM-equipped PowerBook originally due in July. According to sources, the company will now introduce the machine in October along with Hooper, its PCI-capable PowerBook.

Epic will use a 117-MHz 603e PowerPC processor, while Hooper models will include 180- or 200-MHz 603e chips, sources said. Epic's standout features will be a CPU that can be upgraded and optional CD-ROM drive, while Hooper's hallmarks will be its PCI bus, optional Level 2 cache and 12-inch screen.

Hooper will also mark the return of lithium-ion batteries, which were discontinued amid safety concerns after the introduction of the PowerBook 5300.

Sources said Epic will cost $2,000 to $3,500, depending on configuration, while Hooper will sell for $4,500 to $6,500. One source described Epic as "a machine you buy with your own money, while Hooper is a machine you buy with the company's money."

The PCI bus will be implemented in Hooper in three ways: It will be used in the video port and the expansion bay, and it will appear on the motherboard as a card slot. Sources said Hooper will require PCI cards with non-standard form factors and con-

See Laptops, Page 84

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WebBurst takes GUI route to Java development • Digital video effects draw on software, hardware • autodessys adds new twists to form•Z modelers

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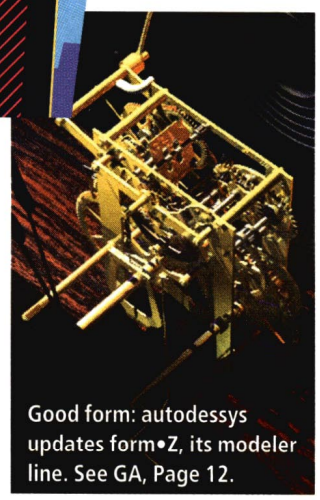
Netscape strikes Mac Web-authoring Gold • N-E-W T-O-O-L-S spell relief for Mac developers • Eudora Pro 3.0 in beta • Oracle plans to add Web publishing to its browser

Mac managers are clever in the way they use sidegrades, but is it always worth the trouble? See Solutions, Page 43.

New tools for desktop publishing: UniQorn takes on the big guys with a page-layout program that uses GX. See Reviews, Page 37.



Good form: autodessys updates form•Z, its modeler line. See GA, Page 12.

Netscape's newest browser, Navigator Gold, is also a Web-page editor. The pre-release version is free. See Gateways, Page 16.

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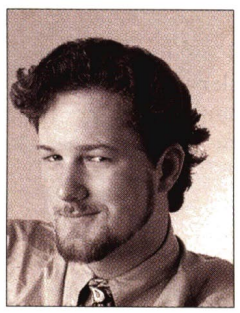
MACWEEK INSIDER STEPHEN HOWARD

'Alternative' music to my ears

I was very encouraged last week to hear an IBM Corp. executive describe the PowerPC reference design. He used two important words: "alternative platform." Those welcome words suggest a possibility of success for the PowerPC alliance, even after Apple, IBM and Motorola Inc. admit defeat in their quixotic challenge to the Wintel standard.

Since 1991 the PowerPC troika has sought to upset the control that Intel Corp. and Microsoft Corp. exert over the PC platform. Today, it's clear that aim is unobtainable.

Weakened by a lack of broad standards and the loss of processor bragging rights, the threesome's chances have decreased steadily in the past couple of years. The revolutionary spark has been all but extinguished over the past 12 months as RISC licensees failed to appear and Intel-standard PC technology and market share grew by leaps and bounds.



You can still find the faithful preaching PowerPC supremacy in Usenet news groups, but the game has been played out, and Wintel won.

As a Mac journalist, it's easy for me to admit that Microsoft and Intel control the PC world. Let me also be the first to say the sky is blue.

But a standard — like the PowerPC Platform (PPCP) or the Mac — doesn't have to be first to win. That's why it was encouraging to hear IBM talking about building an alternative; a strong second standard is as good as it's going to get in this platform war.

The primary concern of the white-shirted fellow from Big Blue's Microelectronics division was how to build up an industry infrastructure to make this alternative platform viable. He talked about contracts with motherboard suppliers, third-party semiconductor designs for I/O logic, independent compatibility certification and technical support for hardware OEMs — topics that Apple, in its clone talk, has broached rarely and never convincingly.

To IBM, it seems the building of a new platform is a nuts-and-bolts endeavor, and the Microelectronics division is focusing on the business details. The attention appears to be paying off.

In the three weeks since IBM signed the deal to license the Mac OS, IBM has been giving its new PowerPC sales pitch to Intel-standard PC suppliers.

According to David Ryan, IBM manager of product-line marketing for PowerPC microprocessors, two mid-size manufacturers in Taiwan have already agreed to build Mac OS-based PPCP machines.

A strong second standard is as good as it's going to get in this platform war.

It was quite exciting to have an executive checking his pager instead of a calendar to see if he could announce new Mac licensees.

IBM seems to have discovered anew its interest in selling chips, and that is very good news for the Mac. As Ryan said, IBM finally "gets it": The Mac is the only volume operating system for the PowerPC, and to sell more silicon, Big Blue is going to have to back Apple in a big way.

The PPCP will never beat Wintel, but even as an alternative platform it needs a momentum that neither OS/2 nor Windows NT can provide. NT on PowerPC will not register big sales for years, IBM said, because the Intel installed base of Windows NT must grow well into the millions before the potential audience for the PowerPC alternative becomes significant. In the meantime, the Mac OS is the biggest game in town.

OS/2 for PowerPC seems to be buried alongside Jimmy Hoffa; I doubt we'll be hearing much about it again.

Even if IBM does well at creating the links in the supply chain that are needed to support a strong No. 2 platform, the results won't show up on shelves until late 1997.

But IBM appears to be positively frisky over the Mac OS, based on reports that Apple and Big Blue are working together on a RISC portable. Perhaps IBM really does get it. □

Stephen Howard is MacWEEK executive editor/news. He welcomes feedback at stephen_howard@zd.com.

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Big Blue licenses Mac OS

IBM plans to build PPCP structure

By Stephen Howard

This week IBM Corp.'s chip division will announce a broad license for the Mac OS aimed at easing the adoption of the upcoming PowerPC Platform for existing personal computer suppliers.

"We make it undebatable that the Mac OS is open," said David Ryan, IBM manager of product line marketing for PowerPC microprocessors. "Because we're in this game, I believe there will be more hardware licensees."

Sources said IBM Japan is also secretly at work designing RISC portables based on the PowerPC Platform (PPCP) specification (see story, Page 84). Apple reportedly plans to ship its first PPCP-based Macs later this year (see 03.18.96, Page 1).

As previously reported, the contract between Apple and Big Blue was initiated by IBM's East Fishkill, N.Y.-based Microelectronics Division, the $2 billion part of the company that builds and sells the PowerPC microprocessor. However, officials said the deal covers all of IBM. Microelectronics Division officials said it can now supply the Mac OS to any of its PowerPC chip customers, including the IBM Personal Computer Co., without restriction.

The contract includes System 7.5 and future versions of the Mac operating system, IBM said. IBM Microelectronics has a similar license with Microsoft Corp. for Windows NT.

IBM is initially targeting 30 system OEMs. Two have already agreed to license IBM's RISC chip and Apple's OS, Ryan said. Big Blue will be hosting a series of closed-door sessions at this month's Apple Worldwide Developers Conference in San Jose, Calif., to talk to Macintosh vendors about the future of the PPCP.

Ryan predicted that the first OEM-class hardware systems will be available this fall and name-brand PPCP machines will ship in 1997.

IBM is making a "significant investment" to build a support infrastructure for PPCP parts suppliers and manufacturers, Ryan said. He said the Microelectronics Division is being trained on the design of Mac OS-compatible machines. Apple will back up IBM's efforts if an OEM's technical problems exceed IBM's understanding, Ryan said.

Ryan added that the Apple-IBM contract included provisions for independent compatibility certification of new machines and contingencies in case the Mac OS needs to be altered to work with third-party hardware.

In related news, IBM said VLSI Technology Inc. of San Jose, Calif., unveiled support chips for PPCP logic-boards. Named Gold Eagle and based on Motorola Corp.'s Eagle PCI and memory controller, VLSI's chip sets support Mac-style I/O. Mountain View, Calif.-based FirmWorks also said its new Open Firmware boot ROMs for PPCP machines will work with the Mac OS. □

Top 5 in 1996 U.S. PC shipments

	Q1 1996		Q1 1995		
COMPANY	UNITS	MARKET SHARE	UNITS	MARKET SHARE	CHANGE
Compaq	715,000	12.7%	525,000	10.7%	36.2%
Packard Bell	620,000	11.0%	590,000	12.0%	5.1%
Apple	415,000	7.3%	480,000	9.7%	-13.5%
Hewlett-Packard	405,000	7.2%	170,000	3.5%	138.2%
IBM	345,000	6.1%	420,000	8.5%	-17.9%
Gateway 2000	335,000	28.9%	260,000	5.3%	5.9%

Source: Dataquest, April 1996.

Market share for Apple drops in Q1

Total U.S. units rise 15 percent

By Mark Hall and Stephen Howard

A decline in first-quarter unit sales put Apple in the No. 3 or No. 4 position in overall personal computer market share, depending on whose research surveys you read. Dataquest Inc. and International Data Corp. released their findings last week.

▶ **Dataquest.** The San Jose, Calif.-based firm said U.S. shipments of PCs hit 5.7 million in the first three months of 1996. That high mark represents a 15 percent increase over the 4.9 million PCs shipped in the first quarter of 1995.

Apple's worldwide sales dipped 13.9 percent to 904,000 units, down from last year's 1.05 million machines. The company held a 5.8 percent share of the market in the first quarter, which was still enough to give it third place after Compaq Computer Corp.'s ninth consecutive quarter in the No. 1 slot and IBM Corp.'s second-place finish. Apple's U.S. market share was 7.3 percent, Dataquest said.

▶ **IDC.** Apple sank to No. 4 in IDC's first-quarter survey, with only 370,000 machines sold compared with 472,000 a year ago. The Framingham, Mass.-based company's tally gave Apple a 6.5 percent share of the U.S. market behind Hewlett-Packard Co.'s 7 percent. IDC blamed Apple's 22 percent drop on nervous customers putting off purchases.

HP toppled Apple for the No. 3 spot by increasing shipments from 173,000 in the first three months of 1995 to 401,000 this year. Compaq also had blistering growth, with unit increases of 40 percent in U.S. sales compared to a year ago.

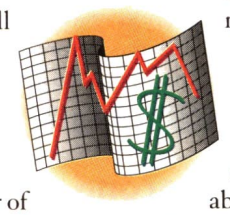
Total U.S. PC shipments for the quarter were 5.73 million, according to IDC, up 14 percent from the first quarter of 1995.

According to Kimball Brown, Dataquest vice president and chief analyst, "[Apple's] downward trend is not an ongoing thing." He said Apple's near-term unit sales will receive a lift from education and consumer sales in the quarters ahead. "However, the long-term trend of the Mac losing share to Wintel is still in place," Brown said. "It'll be another ballgame if the cloning strategy works and IBM's in it."

"A lot of dominoes have to fall for Apple to regain significant share," Brown said. "But there are a lot of constituencies that want them to tumble." □

Fractal revenue increases 85 percent in fourth quarter

By Rebecca Gulick



Completing its first full quarter as a public company, Fractal Design Corp. reported a resounding 85 percent increase in revenues.

For its fourth quarter of fiscal 1995, ended March 31, net revenues rose to $6.55 million from $3.53 million in the same quarter a year ago. Profits for the quarter totaled $918,000, compared with $374,000 for the same quarter of 1994.

For the fiscal year, the Aptos, Calif.-based company said its earnings totaled $2.9 million, compared with net income of $1.8 million for 1994. Revenue grew to nearly $21.8 million in fiscal 1995, a 66 percent jump from the previous year's $13.1 million.

Fractal Controller Braden Rippetoe attributed the company's success to sales growth in international markets, especially Japan's enthusiasm for the flagship Painter; geographic expansion; and new products, particularly Poser, the company's 3-D human modeler.

In February, Fractal announced plans to acquire Ray Dream Inc. of Mountain View, Calif., for 3.25 million shares of Fractal common stock, valued at about $45 million (see 03.04.96, Page 8). Ray Dream Inc. is the developer of 3-D applications such as Ray Dream Designer and Ray Dream Studio. □

Asanté gives boost to Open Transport

By Clifford Colby

Angling to pick up the pace of Open Transport, Apple's new networking architecture, Asanté Technologies Inc. last week delivered NetDoubler. Asanté said the software speeds Finder copies and data transfers in other applications by as much as nine times across 10- and 100-Mbps networks.

NetDoubler is available for PCI and NuBus Macs and must be installed on both the sending and receiving machines. According to the company, a caching scheme helps the utility avoid bottlenecks. NetDoubler also redirects the flow of data across protocol stacks.

NetDoubler comes bundled with Asanté's 10/100BASE T $399 NuBus and $239 PCI cards. The utility is available separately for $99 and is compatible with other Ethernet cards, Asanté said.

In other NetDoubler news, Information Presentation Technologies Inc. last week announced plans for a Unix version of the utility. IPT said it will deliver NetDoubler for its uShare AppleShare-compatible server software in June. The Unix version will cost $495.

Asanté Technologies Inc. of San Jose, Calif., can be reached at (408) 435-8388 or (800) 662-9686; fax (408) 432-7511; sales@asante.com.

Information Presentation Technologies Inc. of San Luis Obispo, Calif., is at (805) 541-3000; fax (805) 541-3037; info@iptech.com; http://www.iptech.com. □

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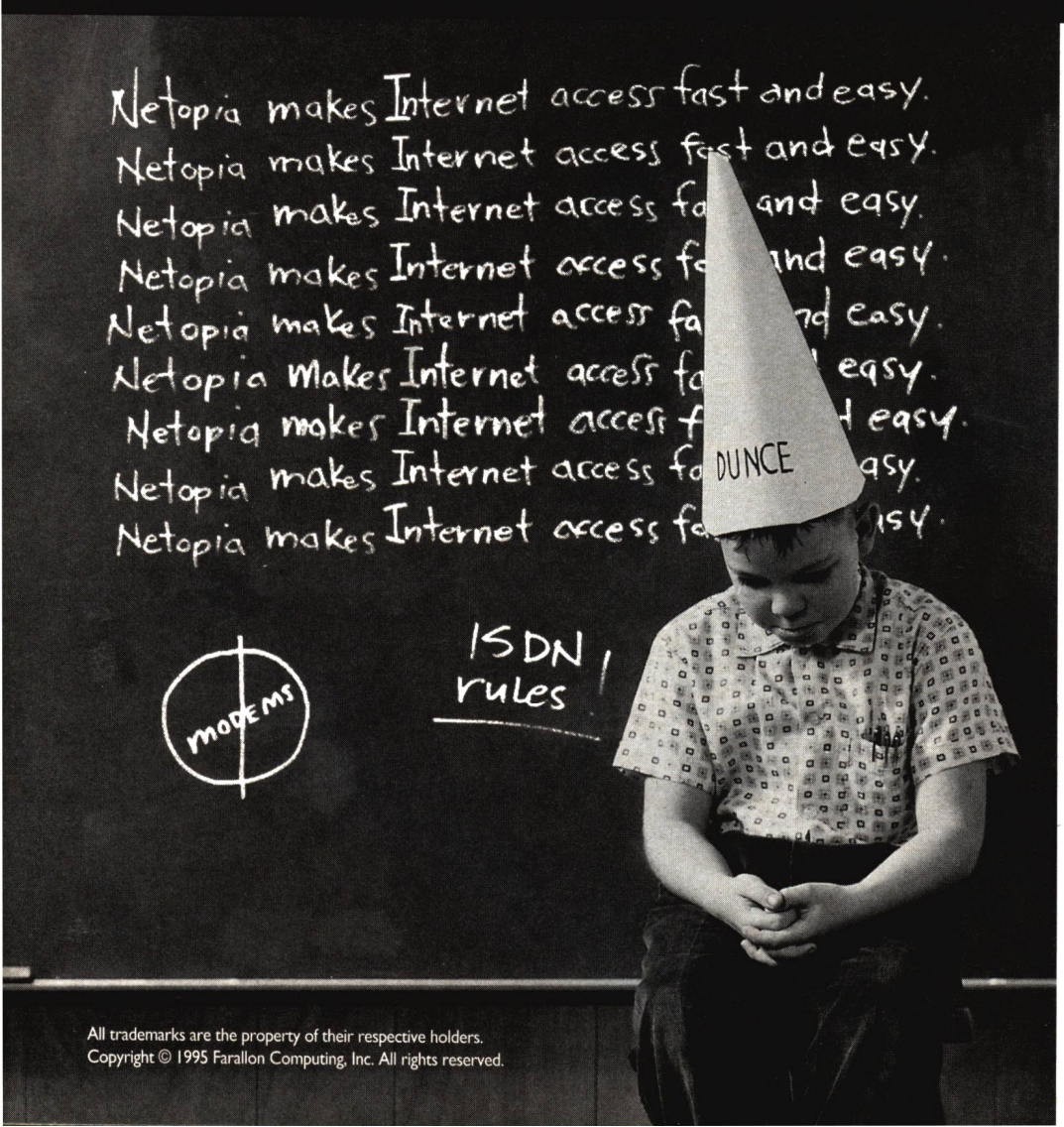
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New LaserJet 5M touts speed, PCL 6

Printer boosts graphics, lengthens duty cycle

By David Morgenstern

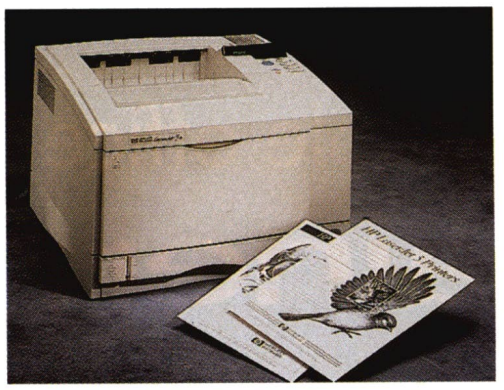
Hewlett-Packard Co. this month shipped the latest in its LaserJet line of black-and-white laser printers.

The $2,229 LaserJet 5M replaces the LaserJet 4M Plus and comes with a 33-MHz Intel i960JF RISC processor, which is 32 percent faster than the previous CPU and a new graphics chip that performs image scaling and halftoning, according to the company.

Similar to the 4M Plus, the new printer offers a resolution of 600 by 600 dpi and an output speed of 12 pages per minute, HP said. It comes with 6 Mbytes of RAM, which can be expanded to 52 Mbytes.

In addition to PostScript Level 2, the printer incorporates PCL 6, the company's new page description language. According to HP, the new language is more efficient than the previous version and boosts speed for graphics.

The 5M has a duty cycle of 35,000 pages per month, up from 20,000 for the 4M Plus. It comes with a 250-sheet letter-size tray and a 100-sheet multisize tray; users can add a $299 500-sheet tray, a $349 75-envelope feeder and a $679 duplexing unit.



HP's new LaserJet 5M offers an improved duty cycle of 35,000 pages per month and lets users add an optional infrared adapter for wireless printing.

The new LaserJet features a redesigned control panel, which can display messages up to 40 characters. It also offers a new job-cancel button.

The 5M comes with parallel and serial ports as well as HP's JetDirect card, which offers Ethernet and LocalTalk ports. A token-ring card is $619; an infrared adapter is $79.

The LaserJet 5, a PCL-only model for the Windows market, costs $1,629. The $1,929 LaserJet 5N is a PCL version with a networking card.

Hewlett-Packard Co. of Palo Alto, Calif., can be reached at (800) 752-0900; fax back (800) 333-1917; http://www.hp.com. □

Groupware for the Internet

By Mark Hall

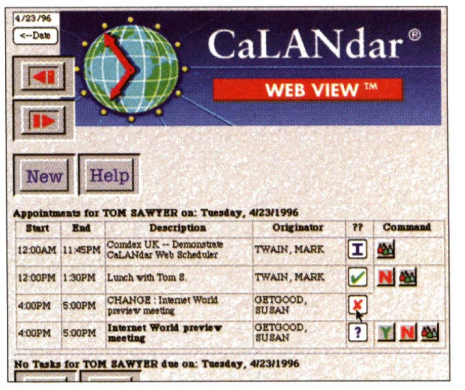
Developers are increasingly latching onto the Internet as the foundation for next-generation groupware applications.

Microsystems Software Inc. last week began shipping CaLANdar WebScheduler, which lets remote users access their schedules using a standard Web browser.

The product has two variants. The $995 WebScheduler gives users full control of their schedule as if they were on the local network. Users of the $595 WebView version can only view their schedules and accept or decline meetings.

The software can handle up to 32 simultaneous connections to the CaLANdar server from remote users. It can be configured behind a fire wall in an intranet or used anywhere on the Internet. It requires a browser that can handle tabular information, the company said.

WebFlow Corp. has targeted project teams within organizations with its SamePage Intranet Work Processor software, which also began shipping last week. The application creates a structured workspace of multimedia objects that can be accessed by teams online via Web browsers that support tables.



With WebScheduler and WebView, users can access schedules via the CaLANdar server's URL.

The program is designed for use within a secure intranet and includes multiple levels of user permissions and access.

SamePage costs $350 per user; a 10-user version is $3,000. Higher discounts are available for sites of more than 10 users.

Microsystems Software Inc. of Framingham, Mass., is at (508) 879-9000 or (800) 489-2001; fax (508) 626-8515; info@microsys.com; http://www.microsys.com.

WebFlow Corp. of Santa Clara, Calif., can be reached at (408) 235-1400; fax (408) 235-1410; http://www.webflow.com. □

Microtek kicks in 30-bit flatbed

By Matthew Rothenberg

Microtek Lab Inc. has rounded out the low end of its flatbed scanner line with a 30-bit-color model.

The ScanMaker E6, which starts at $599, joins the $399, 24-bit-color ScanMaker E3 (see 01.22.96, Page 6). The new device's CCD (charge-coupled device) array captures 10 bits each of RGB or gray-scale color data per pixel in a single pass, then optimizes the image in 24-bit color.

The E6 also offers an optical resolution of 600 by 1,200 dpi, twice that of the E3, Microtek said. Users of the new scanner can interpolate images up to 4,800 dpi via software.

The SCSI-2 device can scan reflective originals measuring up to 8.5 by 13.5 inches. According to the company, the E6 can capture a 5-by-7-inch color image at 300 dpi in about 42 seconds.

A transparency adapter and a 10-sheet automatic document feeder cost $299 and $199, respectively.

The E6 ships with Microtek's ScanWizard scanning utility, which lets users adjust brightness, contrast and exposure; tints; shadows and highlights; blur, sharpen and unsharp masking; 16-point gamma curves; and other image controls. The scanner also comes standard with Caere Corp.'s OmniPage Direct OCR software and MicroFrontier Inc.'s Color It! 3.0 painting application.

Mac users can buy a $799 Pro Version that includes Live Picture 2.1.

The company also said it plans to ship a $599, 24-bit-color version of the E6 aimed at the Internet market. The ScanMaker E6 Internet Edition, due in June, will come bundled with Adobe Systems Inc.'s PageMill.

Microtek Lab Inc. of Redondo Beach, Calif., can be reached at (310) 297-5000 or (800) 654-4160; fax (310) 297-5050; http://www.mteklab.com/. □

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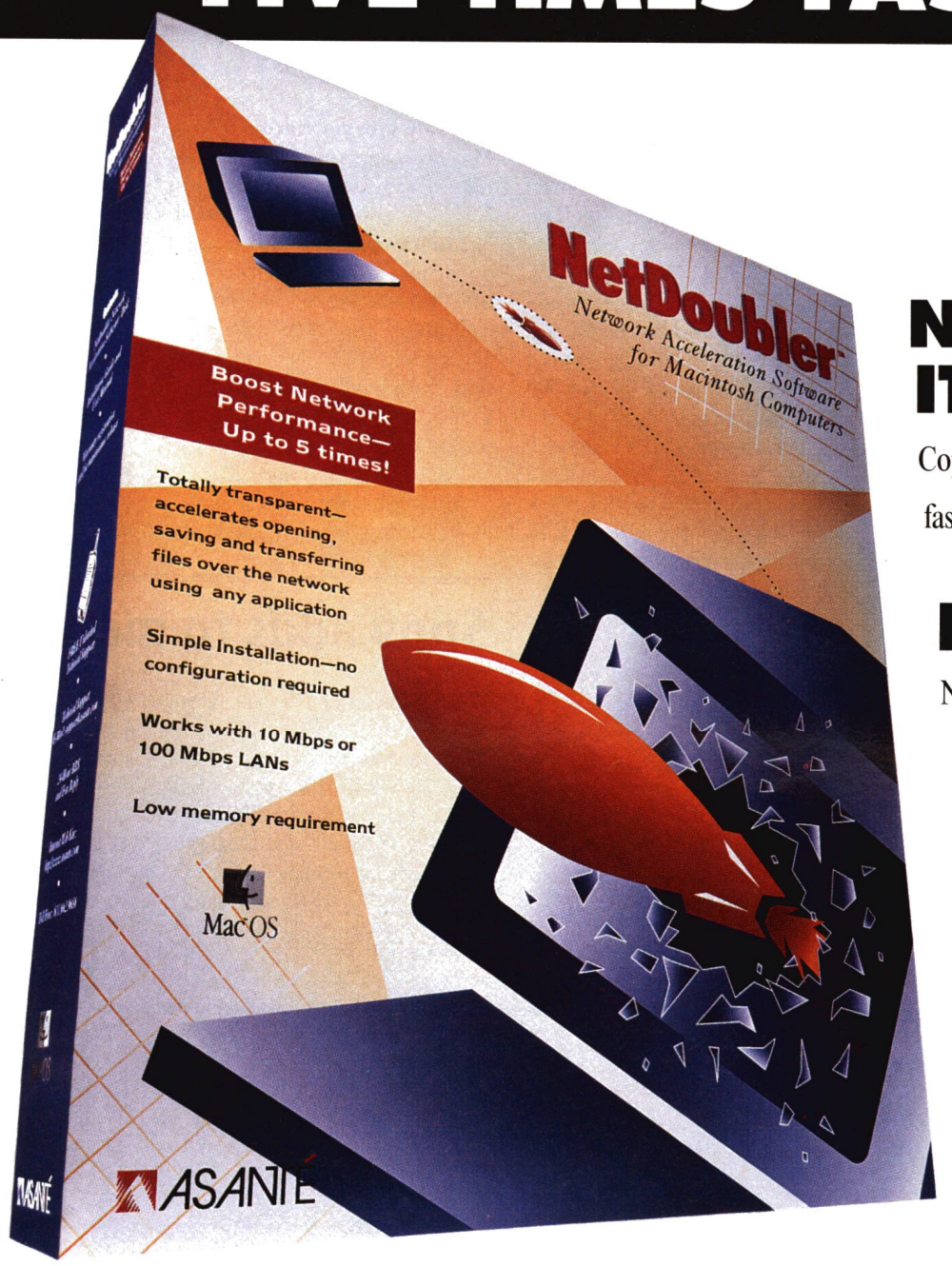
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Optix 5 to improve doc links

By David Morgenstern

Blueridge Technologies Inc. expects to update its cross-platform Optix Network document-management system in June, adding new file-linking and annotation features.

Version 5.0 of the $60,000 system will let users generate links automatically among Optix documents by dragging a file's link icon to another file, Blueridge said. Previously, users had to search for related documents.

The software will connect third-party documents via a dialog box or by dragging file icons onto a link button on the file's tool bar. The button will display the links in a pop-up list.

In addition to local or networked Optix image files and documents from third-party applications, users will be able to attach URLs (uniform resource locators) to Web pages on the Internet, Blueridge said.

The update's annotation feature will let multiple users mark a document with color-coded drawing and text tools. Blueridge said the annotations will be stored as layers independent of the original file, and users can view others' annotations separately or in combinations. The software will also provide security and let managers determine which members of a group can view annotations.

The Version 5.0 Mac client will be Power Mac-native, significantly improving performance, according to the company. The system also supports new Windows 95 and Windows NT clients. The Optix server software runs on Windows NT and Unix systems, including Apple's AIX-based Network Server 500 and 700 models.

The company said Version 5.0 is being rewritten in C++ and offers a new set of APIs that work with Remote Procedure Call technology for both clients and servers.

The update will be free to users of Optix Network 4.3 with software-maintenance agreements; an update for the single-user Optix version is due later this year, Blueridge said.

Blueridge Technologies Inc. of Flint Hill, Va., can be reached at (540) 675-3015; fax (540) 675-3130; optix@blueridge.com; http://www.blueridge.com. □

Optix Network 5.0 will let users create links among image files, Web pages and ordinary documents.

Micro Design mounts eight-slot CD tower

By David Morgenstern

Micro Design International Inc. recently released its CD-Express Tower, a new CD-ROM server.

The tower holds up to eight quadruple- or sextuple-speed Toshiba CD-ROM mechanisms. A configuration packed with eight 4x drives costs $4,095 and a version with eight 6x units costs $5,095. Each drive has an MTBF (mean time between failure) of 100,000 hours, MDI said.

Although users can assign a SCSI address to each drive, the tower also comes with a controller that lets it use a single ID, the company said. However, to utilize the controller, users must purchase MDI's SCSI Express CD-ROM Extended Server software for an additional $1,495. The software also provides directory caching capabilities.

Micro Design International Inc. of Winter Park, Fla., can be reached at (407) 677-8333 or (800) 228-0891; fax (407) 677-8365; sales@microdes.com; http://www.microdes.com. □

Sony adds to media options

Sony Electronics Inc. last week began shipping two new flavors of removable media: the QTR-1SL 200-Mbyte Travan technology cartridge and a Sony-branded 100-Mbyte Zip disk for the popular drive from Iomega Corp.

The QTR-1SL cartridge, which can handle 400 Mbytes of compressed data, uses the QIC-80 storage format for Travan drives and costs $18.95. Sony's Zip disks will retail for $19.99 each.

The company said it intends to offer both media through a range of retail outlets worldwide. □

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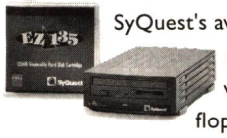

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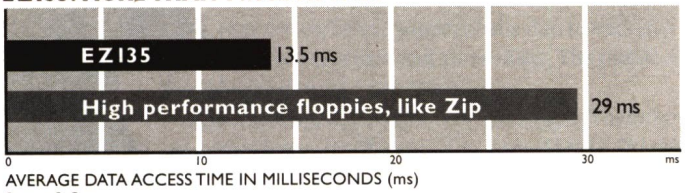

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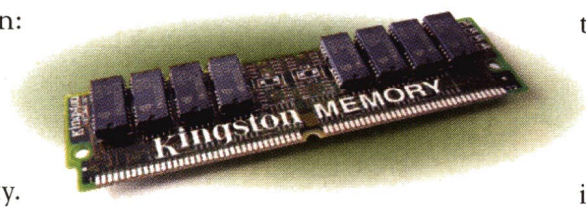

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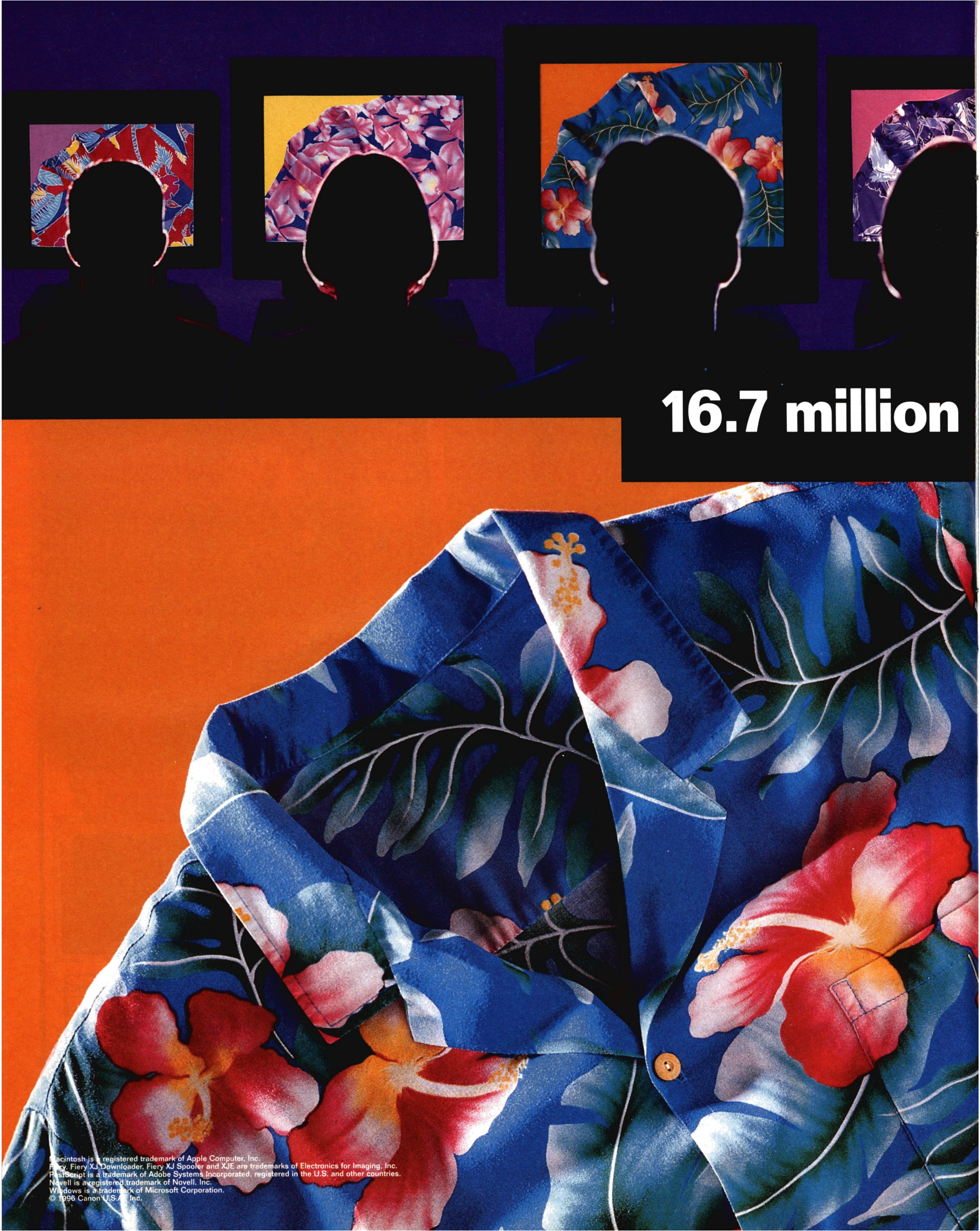

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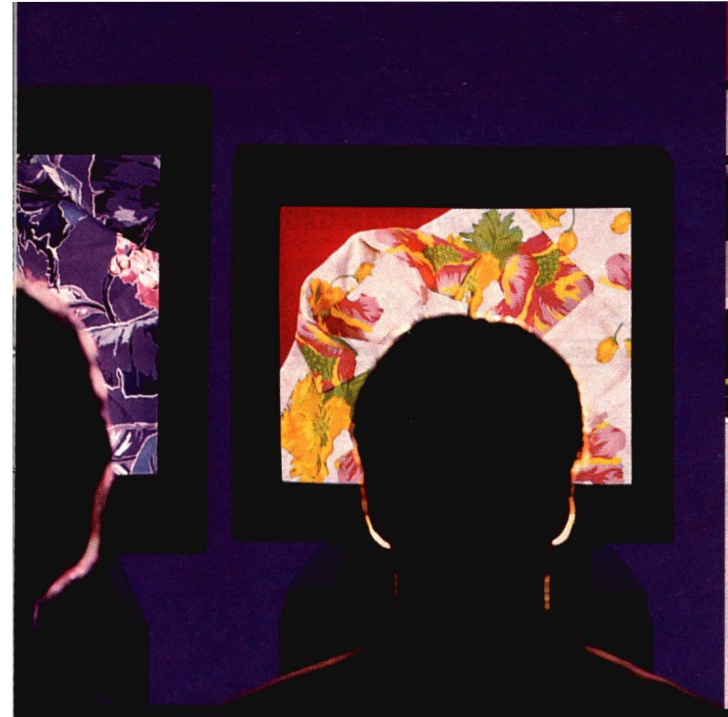

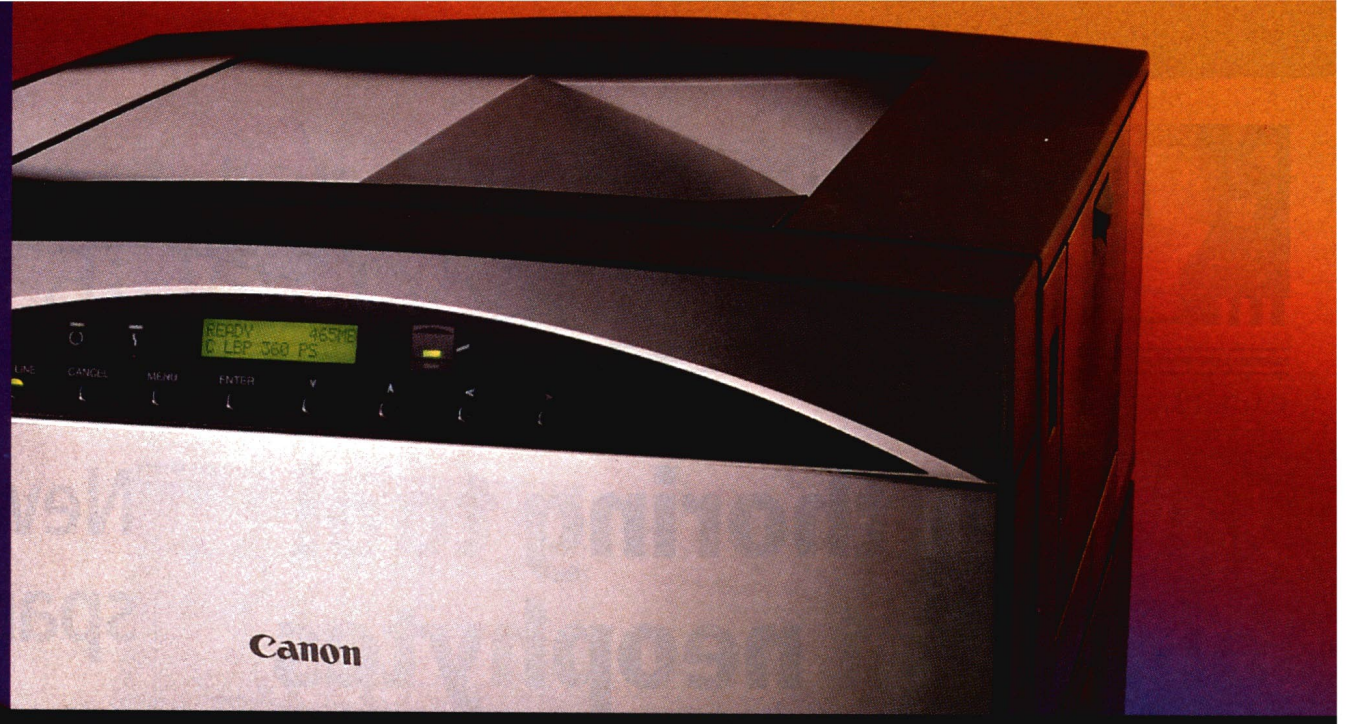

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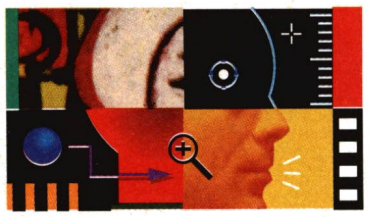

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For the lowdown on SoftPress' QuickDraw GX-based page-layout program, see Reviews, Page 37.

Java authoring tool aimed at neophytes

WebBurst builds applets graphically

By Rebecca Gulick

Until now, Java development has been the exclusive domain of programmers. PowerProduction Software hopes to change all that with an interactive multimedia authoring tool for creating applets in Sun Microsystems Inc.'s programming language.

Slated to ship in May for $299, WebBurst will let users employ drag-and-drop and point-and-click operations instead of code to build Java applets. A free beta version of WebBurst is available on the company's Web site.

WebBurst, which PowerProduction demonstrated in Apple's booth at the Spring Internet World show in San Jose, Calif., last week, is based on Digital Box Office, PowerProduction's multimedia development tool (see 07.24.95, Page 1).

WebBurst, PowerProduction Software's Java authoring tool, lets nonprogrammers drag and drop sounds and animations into Web pages.

Like Digital Box Office, WebBurst uses a combination of frame- and object-based authoring functions and offers conditional branching, a library metaphor for handling animations, and interaction among images and sounds.

Each object in a project resides within its own layer, making it easier for designers to reposition it. The software's drawing tools can be used to create hot spots within elements.

WebBurst lets designers create path-based animations, PowerProduction said. The Animate and Action Controller dialog boxes control cycle speeds and frames. Action Controller lists all actions assigned to objects or frames.

Users will simply drag elements, such as PICT, GIF or TIFF images; AIFF (Audio Interchange File Format), .WAV, .AU and snd audio files; and PICT animation sequences, into the creation window. WebBurst will export the elements to Java, converting sounds to the .AU format and images to GIF. WebBurst will not support QuickTime or 3DMF (3-D

See WebBurst, Page 14

New video effects span hardware, apps

By Kelly Ryer

Digital video effects tools are zooming onto the Mac desktop from all angles.

From the software perspective, Artel Software Inc. in April released a major revamp to its video effects plug-ins. And taking a hardware slant, Pinnacle Systems Inc. recently announced plans for a pair of PCI-based digital effects boards.

Artel's Boris Effects 2.0 comes in two versions for Power Macs only: a $695 plug-in for Data Translation Inc.'s Media 100 system and a $350 version that plugs into Adobe Premiere.

Once installed, the plug-in appears on the transition list in both Media 100 and Premiere and lets users create effects such as tumbling or spinning video elements, borders and drop shadows, credit rolls, and 3-D effects. The software comes bundled with more than 20 preset keyframes, including Old Newspaper Spin and Rotating Dissolve.

New features in Version 2.0 include support for multiple video and graphics tracks, unlimited keyframes, soft-edged borders and shadows, and spline-controlled motion paths. Upgrades from Version 1.0 are $99 or $49 for the Media 100 or Premiere plug-ins.

See Video, Page 14

Boris Effects, Artel's digital video effects generator, can control the movement of video elements in three dimensions via x, y and z coordinates.

autodessys rounds out its modeler line

By Kelly Ryer

Three-D developer autodessys Inc. updated its modeler line in April with new versions of form•Z, the company's high-powered 3-D surface and solids modeler, and form•Z RenderZone, an enhanced version that features rendering capabilities. Both upgrades have been dubbed Version 2.8.

Illustrator Stacey Lewis created and rendered this clockworks mechanism with autodessys' form•Z RenderZone. Version 2.8 includes hard shadows in its ray tracer.

The company said Version 2.8 of the $1,495 form•Z includes several new features, such as an enhanced Query tool, export of Adobe Illustrator files and some interface enhancements. Thanks to Power Mac optimization, the new version is 35 percent faster on average than Version 2.7, autodessys said.

The form•Z RenderZone application is a $1,995 version that lets users render models via several methods, including Gouraud shading, Phong shading and ray tracing.

New features in RenderZone 2.8 include spherical environment maps, alpha-channel support in backgrounds, hard shadows in ray tracer and memory estimates for rendering. Users can now save partially rendered images and choose whether to render a particular object as a faceted shape or a NURBS (nonuniform rational B-splines)-based shape.

Upgrades are $125 for owners of Version 2.7 of either program. In addition, both applications are now available for the Windows 95 and NT platforms.

autodessys Inc. of Columbus, Ohio, can be reached at (614) 488-9777; fax (614) 488-0848; formz@aol.com; http://www.formz.com.

Streaming MPEG hits Web

By Rebecca Gulick

InterVU Inc. will add to its portfolio a new software-only MPEG player that displays video — slowly — as it streams over the Internet. A beta version is available now on the company's Web site; the free final version is due this summer.

With the InterVU MPEG Player, users can watch standard MPEG files as they download to their machines from a remote Web site. The Netscape Navigator 2.0 plug-in displays the first frame of a video when a Web page is loaded, so the user can decide whether or not to download the movie. The plug-in also saves the entire MPEG file in Navigator's cache for playback later at full quality.

The bandwidth of the user's Internet link limits movie-playback performance. For example, with a small 160-by-120-pixel movie and a 28.8-Kbps Internet link, users will see streaming video at 2 to 5 frames

See MPEG, Page 14

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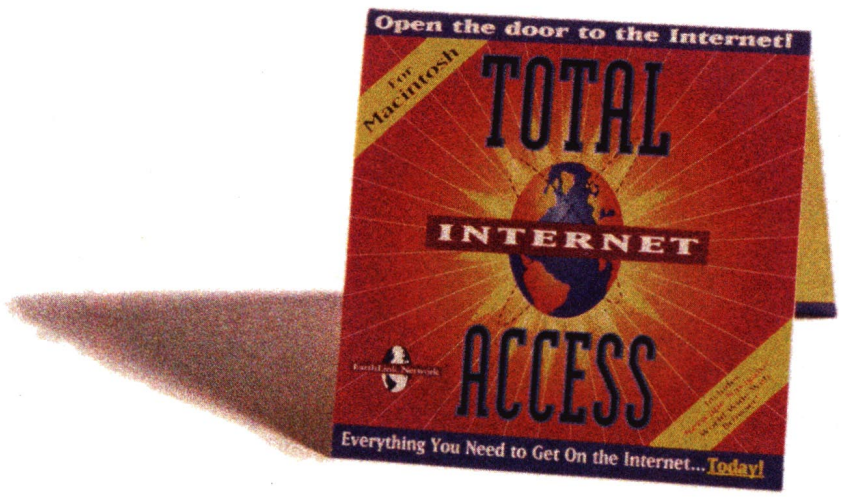

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Video

From Page 12

Plug-ins will also be key to Pinnacle's new Genie family, although the effects themselves are generated by PCI boards.

The $5,990 GeniePlus is scheduled to ship in July. The system, consisting of the Genie PCI card, an I/O daughtercard and software, will work with nonlinear desktop video editing systems such as Avid Technology Inc.'s MCXpress (see 03.18.96, Page 12).

Two frame buffers, two frame synchronizers, a double-input switcher, a character generator and an assortment of painting tools will let users create effects such as page turns, warps, ripples, spheres, shadows and borders. GeniePlus will work with composite or S-video as well as Digital Video camcorders.

Pinnacle also announced the GenieFusion board, scheduled to ship this fall for less than $6,000. Designed to integrate with nonlinear desktop editing packages, including Premiere and Media 100, the GenieFusion will lack the I/O card of the GeniePlus. It will work with any QuickTime-compatible hardware compression, including JPEG and editable MPEG, Pinnacle said.

According to the company, the GenieFusion hardware will outperform many software-based packages when generating transition effects such as page turns with highlights and shadows, water ripples, spheres, slats, and waves.

Pinnacle said GenieFusion users will be able to upgrade to GeniePlus if they wish to move from nonlinear to linear editing. Upgrade pricing has not been set.

Artel Software Inc. of Brookline, Mass., can be reached at (617) 566-0870; fax (617) 731-6787; artel soft@aol.com; http://www.tiac.net/users/artel.

Pinnacle Systems Inc. of Sunnyvale, Calif., can be reached at (408) 720-9669 or (800) 474-6622; fax (408) 720-9674; http://www.pinnaclesys.com/. □

InterVU's software-based MPEG player delivers streaming and cached playback of video embedded in Web pages.

MPEG

From Page 12

per second, InterVU said. With a cached movie on a 100-MHz or higher PowerPC 604, users will see 15 fps at 320 by 240 pixels.

Users watching online movies can stop streaming playback at any point, and the plug-in supports MPEG commands including looping, playing in slow motion, displaying at different sizes and hiding the tool bar. The beta version of the plug-in does not implement MPEG's sound channel, but the final version will, InterVU said.

InterVU MPEG Player runs on PowerPC- and 680x0-based Macs; Power Macs must be running System 7.5.3, but older Macs can run any version of System 7, the company said. A beta of the InterVU plug-in for Windows shipped in March.

InterVU Inc. of Solana Beach, Calif., is at (619) 350-1600; fax (619) 793-2525; info@intervu.com; http://www.intervu.com. □

WebBurst

From Page 12

metafile format) until Sun does, PowerProduction said.

As users create projects, they will be able to preview their applets or export the project and view it via a browser, Power Production said. Mac-based clients will need to use Netscape Navigator 3.0, currently available in a public beta, to view Java-based animations created with the software, the company said.

Memory-management functions will let users determine when items should load into RAM. For example, objects can be preloaded to make transitions smoother.

PowerProduction Software of Hermosa Beach, Calif., can be reached at (310) 937-4411; fax (310) 937-4416; pps@netcom.com; http://www.powerproduction.com/. □

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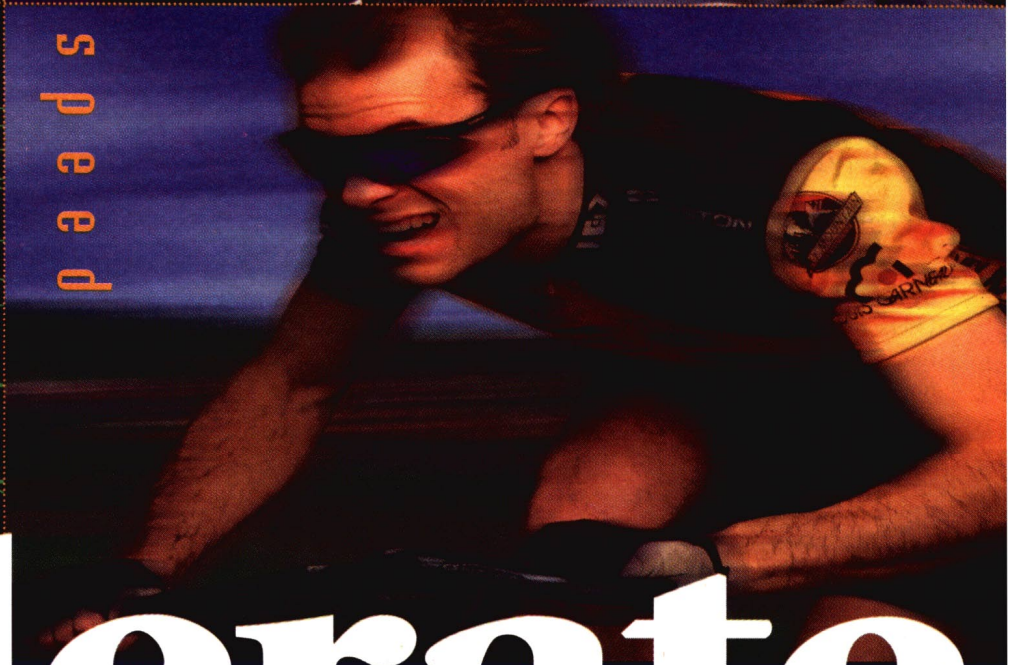

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MacBench 3.0 publishing graphics mix test performed on Power Mac 9500/132 with 40MB of RAM @ 1152 x 870 in 16.7 million colors with Matrox Millennium for PCI Power Mac, Number Nine Imagine 128, IMS Twin Turbo 128 and Radius Thunder 3D/1600.

Navigator Gold beta constructs Web pages

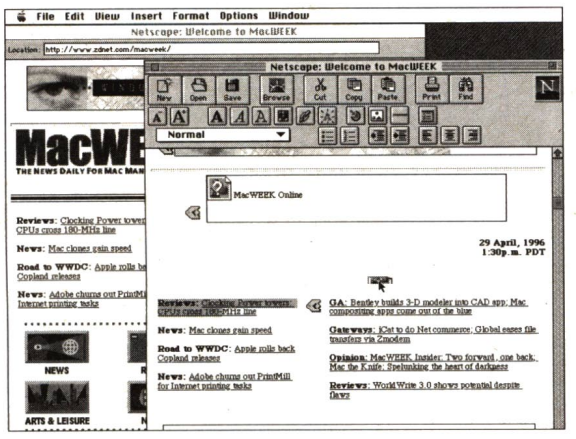
HTML editor creates frames

By James Staten

Users of Netscape Communications Corp.'s Web browser can now create the kinds of pages they see, thanks to the free prerelease of Navigator Gold for the Mac, a version of the company's browser featuring HTML editing capabilities.

Navigator Gold, released last week in beta form and due to ship this summer for $79, is a combination Internet client and Web-page editor. It provides all the features of Navigator 2.0, including the e-mail and Usenet news components, as well as support for Sun Microsystems Inc.'s Java programming language. A beta release of Navigator 2.0 that offers Java support shipped in February.

Navigator Gold adds a WYSIWYG editor that allows users to create documents with tables; frames; images; and links to Netscape plug-ins, Java applets and JavaScripts. Gold features multilevel Undo and rich-text controls for assigning font size, color and style.



Is it a browser or an HTML editor? Navigator Gold, released in beta form on the Web last week, performs both functions.

Netscape said the features for the Mac beta are not complete. The final version will include drag-and-drop support, keyboard shortcuts, several additional interface features and source-level HTML editing. Also in the final will be One-Button Publishing, a feature that will let users send their documents to one of several Internet service providers and have them automatically served.

Navigator Gold is designed as an online creation tool, Netscape said. The manual, tutorial and several page-creation primers are provided through the Netscape Web site. Its Web-based features include a collection of editable home-page templates, backgrounds, images, JavaScripts and Java applets, as well as the Netscape Page Wizard, a Web page-creation tool that walks the user through a series of fill-in-the-blank questions to build their first page.

Netscape also released a free beta of Netscape Chat, a $24.95 Internet Relay Chat client that integrates with Navigator 2.0 or later.

Netscape Communications Corp. of Mountain View, Calif., can be reached at (415) 528-2555 or (800) 638-7483; fax (415) 528-4140; http://home.netscape.com. □

Oracle tuning Web browser for intranets

By James Staten

Oracle Corp. plans to turn its Web browser into a searching and publishing tool for intranets. The free Power Browser, due for the Mac this summer, will feature client-side database query tools and a built-in Web server.

Oracle said its browser will access any database with an Open Database Connectivity driver. Power Browser will generate a series of HTML forms in which the user can build a query. Information received from the database will be organized on receipt into an

See Oracle, Page 18

Qualcomm releases beta of next version of Eudora

By Clifford Colby

Qualcomm Inc. last week started a semipublic beta program for the next version of its Eudora Pro e-mail package.

Qualcomm said Version 3.0 will include improved mail filtering and find capabilities, drag-and-drop support, and address book and interface improvements (see 04.01.96, Page 1). The company said Version 3.0 will also provide an API to let third-party developers add translation and security features to the program.

Although the beta features a modified interface, Qualcomm cautioned that its face may change in the final shipping version.

The beta software is available on Qualcomm's Web site at http://www.qualcomm.com. Beta testers must have Version 2 of Eudora Pro, and Qualcomm said the beta software will expire on June 1. The final version is expected to ship in July.

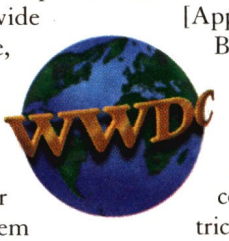
Qualcomm Inc. of San Diego can be reached at (619) 587-1121; fax (619) 658-2100. □

ROAD TO WWDC

Developers seek simpler way of life

By Clifford Colby

Making programming easier is high on the wish lists of many Mac developers as the Apple Worldwide Developers Conference approaches. They hope to find some tools to provide relief at the San Jose, Calif., show this month.



"The problem is that C++ is so bad," said Anthony Meadow, president of Bear River Associates Inc., a system integrator in Oakland, Calif. "Developers spend too much time doing battle with memory allocation/deallocation and error handling. These two tasks are low-level in nature and ... can be solved in a reasonable manner automatically."

Jeremy Roschelle, a software designer at the SimCalc Project in San Francisco, agrees that the complexity of tools can get in the way of development. "Simple, quick, familiar tools and techniques are the key," Roschelle said. "Pushing back Denali [Apple's upcoming Visual Basic-like tool] hurts."

Roschelle uses OpenDoc to build simulations for teaching children advanced mathematical concepts. He said the intricacies of development can hinder the adoption of new technologies such as OpenDoc. "To broaden acceptance, Apple needs to flatten the learning curve for OpenDoc," Roschelle said.

Meadow said: "The marketplace has demonstrated that it often will accept a good enough technology rather than pay any

See WWDC, Page 18

eXodus 6.0 does X Window

By Joanna Pearlstein

Adding native Open Transport support, White Pine Software Inc. last month rolled out eXodus 6.0, the company's X Window System server.

The new version, first announced last fall (see 09.04.95, Page 18), is compatible with the latest X protocol, Version 11 Release 6. That standard includes additional font types, new X extensions and new window-management tools.

eXodus includes a VT320 terminal emulator and support for the Common Desktop Environment, a Unix interface standard. eXodus can now connect to Windows NT hosts and run NT applications through NTrigue, Insignia Solutions Inc.'s Windows NT X client.

Version 6.0 of eXodus costs $295; upgrades from previous versions are $95.

White Pine Software Inc. of Nashua, N.H., can be reached at (603) 886-9050; fax (603) 886-9051; info@wpine.com; http://www.wpine.com.

White Pine Software's eXodus 6.0 provides an X Window into the Unix world. It has also been optimized for use with Open Transport.

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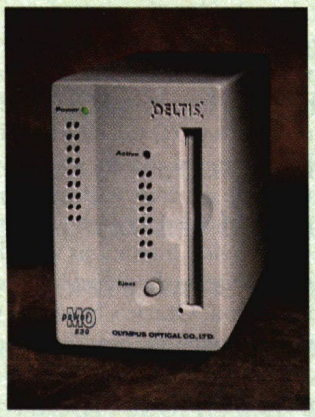

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WebLock speeds servers, eases security

By James Staten

Maxum Development Corp. hopes to speed Mac-based Web servers and ease security setup with a utility it shipped last week.

WebLock, an ACGI (Asynchronous Common Gateway Interface), functions as a preprocessor for Web servers. The $195 utility caches HTML and graphics files in RAM, allowing the server to deliver these items faster. InterCon Systems Corp.'s InterServer Publisher 1.2 already caches files; Quarterdeck Corp. said the feature will be added to WebStar 2.0, which is due in June.

Maxum's WebLock also lets users configure the security of their servers using the Mac OS' file sharing and Users & Groups control panels, rather than a Web server's security realms. Administrators can select individual folders to protect and create users with specific access privileges.

A version of WebLock compatible with WebStar 1.3's new plug-in architecture will be available later this month.

WebLock costs $595 in a bundle with several other Maxum products. Users of any other Maxum program can purchase WebLock for $125.

Maxum Development Corp. of Streamwood, Ill., can be reached at (708) 830-1113; fax (708) 830-1262; info@maxum.com; http://www.maxum.com. □

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WWDC

From Page 16

price — even a small one — to get great technology. For a great technology to succeed, the vendor must demonstrate compelling reasons that are sufficient to motivate people to decide to pay the price for the transition."

Developing for multiple platforms is another area that developers say could use work. "Cross-platform development is a pain," said Sean Parent, Macintosh technical lead for Adobe Photoshop for Adobe Systems Inc. of Mountain View, Calif. "You want to be developing and debugging on the target machine. We would love to have CodeWarrior hosted on Windows," said Parent, who used the environment from Metrowerks Inc. to create the latest Mac version of Photoshop.

While Parent said he was happy with CodeWarrior and comfortable with having many of his development tools come from third parties, he said there are ways Apple could help its developers.

"Apple should do what they can to support their third-party developers, but the company should fill in niches in the Mac programming market that are not necessarily profitable but are necessities for developers," Parent said. He pointed to source-code management, low-level debuggers, profiling and optimizing tools, and highly optimized compilers as areas where Apple could provide tools. □

Oracle

From Page 16

HTML page by the browser. Secure Sockets Layer 3.0 encryption and authentication will protect the connection, Oracle said.

Power Browser will implement BASIC scripting and Sun Microsystems Inc.'s Java. The program will also support Oracle's Network Loadable Objects, which will download to the client from a secure server to add new functions.

Included with the browser will be a small Web server, based on HTTP (Hypertext Transport Protocol) 1.0, which will let users publish their own content. A software wizard will help generate a simple home page. Although intended for in-house use, Oracle said no technical limitations would prevent the server's use on the global Internet.

In addition, Oracle's browser, which is built atop Spyglass Inc.'s Enhanced Mosaic, will support Netscape Navigator plug-ins, HTML tables and frames.

Oracle Corp. of Redwood Shores, Calif., can be reached at (415) 506-7000 or (800) 672-2531; fax (415) 506-7200; http://www.oracle.com. □

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BPA INTERNATIONAL

Which master?

The news that Copland will not ship until mid-1997 sliced through the Mac world last week and left a curious, twin-tailed pattern of turbulence in its wake. Developers are sanguine; users are mad.

The different reactions will rend the Macintosh community for the rest of the year and fuel more predictions of Apple's doom. The divide arises simply because an operating system is different things to different people.

Developers are — in the main — happy to wait for a better Copland. The OS is the platform for their work, so programmers and marketers want stability above all. Many hoary Mac vendors have had Copland's crash-prone Developer Release 0 for months; their view of the OS is the sorry state of the initial version. They've seen how far Copland is from completion, and they'll gladly wait for something better.

Users, on the other hand, view the OS upgrade as a feature of their computers. Copland is Apple's promised enhancement to the hardware they've already bought, and the update remains the perfect stuff of dreams. The perpetual delays feel like bait-and-switch tactics, creating unnecessary frustration for them.

These perspectives seem to define the split attitudes about Copland and Apple's future prospects. Angry Mac users — the long-suffering ones who are the backbone of the company's success — began complaining loudly and forecasting Apple's demise last week. Third-party vendors, and others close to the development realities of Copland, do not understand the furor and think it borders on the hysterical.

Right now, as Apple actively redefines its priorities, the operating system has become a political issue that pits the wants of developers against those of users. The company tried to serve both constituencies in setting the initial goals for Copland; it may not be able to do so in the future.

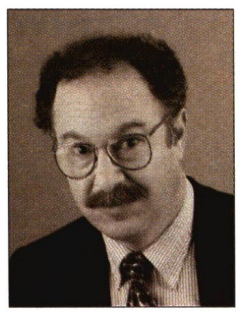
Apple's moves on Copland and its continued improvement of System 7.5 will show which master has more clout in in Cupertino, Calif.: developers or users. □

THE SECOND DECADE HENRY NORR

Thinking the unthinkable: Time to deep-six Copland

Here's a suggestion for what Apple should do about Copland: Kill it.

Am I serious? Frankly, I'm not sure. But I think the idea is worth exploring.



The 7.7 alternative

Even if Apple can deliver on its latest Copland timetable — no sure thing — the plan leaves the company without a significant OS update for more than a year. During that time Microsoft Corp. will integrate Windows 95 with the Web and take an overhauled Windows NT into the corporate mainstream.

Instead of that grim scenario, suppose Apple were to ship a new version of System 7.x early next year, then concentrate all available resources on Gershwin, the planned successor to Copland. The next release — call it System 7.7 — could include Copland's most eye-catching feature, its customizable look and feel; after all, the Appearance Manager has been running on System 7.5 in Apple's labs for years now. (If that won't work, the company could always license Greg Landweber's Aaron extension!)

Integration with the Internet is a bigger challenge, but there, too, Apple has a solution at hand: Cyberdog. I still have some reservations about Cyberdog and OpenDoc, but at this point Apple's guiding principle has to be "Use what you've got to get what you need," and in the Internet arena Cyberdog is what it's got.

Apple could go a long way toward addressing the biggest problem with Cyberdog — its isolation from the main currents of Internet development — by licensing Spyglass Inc.'s forthcoming OpenDoc browser, or at least the parts that run Java applets and Netscape Navigator plug-ins. (Hey, mighty Microsoft is basing its Internet strategy on Spyglass code!)

And if it's going down the OpenDoc road anyway, I think Apple should go all out and build in the forthcoming OpenDoc-container version of ClarisWorks. Besides adding immediate, easily understood value to the Mac OS, that would give users a way to take advantage of what really distinguishes Cyberdog.

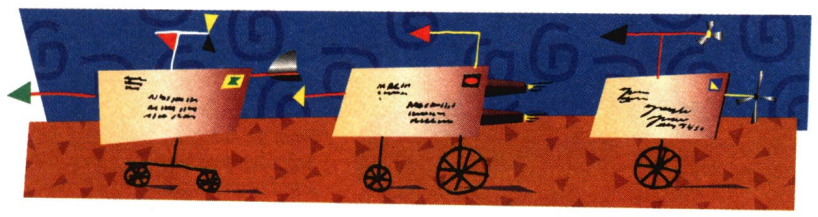
Finally, some plumbing: The hypothetical System 7.7 needs a fully supported, Open Transport-savvy Point-to-Point Protocol driver. Apple has had such a project on the books for years; now's the time to get it done.

On to Gershwin

If Apple could deliver all that by next winter, it would address most of what customers want from Copland. The one exception is the mounting clamor for greater stability. But Copland would be a limited solution to this problem, since it would leave all applications that make use of the Mac toolbox still vulnerable to each other's misbehavior. The only solution is what Gershwin promises — a fully re-entrant toolbox and protected memory spaces for each application — so why waste time with halfway measures?

In other circumstances, canceling Copland would be an unthinkable embarrassment. But in the current crisis I believe the market would take it as a welcome sign that Apple's new leadership is willing to rethink old assumptions and make bold changes. □

Henry Norr, editor emeritus of MacWEEK, welcomes feedback in the MacWEEK forums on CompuServe or at henry_norr@macweek.com.



LETTERS

QTVR ain't out

I notice you list Apple's QuickTime VR as a so-called "out" (04.22.96, Page 66). I, as an employee of Electronic Data Systems, say it's alive and well and have evidence of the technology being used in areas of advertising, sales and promotion for various forms of transportation. General Motors, BMW and Harley-Davidson have all jumped on the QTVR bandwagon, and I'm sure more companies will follow. Granted, it may be difficult to actually get the QTVR ball rolling because of the initial expense, but once a movie is produced, the end product is pretty slick!

Carl Vander Bee, systems administrator
Electronic Data Systems, Warren, Mich.

Apple is GX roadblock

Apple's PowerTalk may be wayward at this point, but QuickDraw GX is definitely not (04.22.96, Page 66). Features like intelligent fonts, editable regions of skewed text and resolution-independent graphics (imagine a 300-dpi screen) are nothing to sneeze at. The only thing stopping QuickDraw GX from success is Apple's reluctance to make it cross-platform, like QuickTime.

Wes Simonds, computer consultant
Austin, Texas

Bump in the road

Based on your review of the new PCI Macs (04.22.96, Page 1), the pricing policy toward the latest speed-bump Macs is faulty. First of all, these models are late to market, offering only modest improvements in performance compared with the models they replace (when one compares comparably equipped models) and no better performance than less expensive clones already available.

In spite of this, Apple has priced them nearly as high or even higher than the previous models. The predictable result will be that they will sell slowly. If the past is any lesson, this will result in unsold inventory and deep price cuts later in the year to move unsold units. If this results in further delay of the next round of PowerPC 604e-based models (which should be worth the extra bucks), one has a self-perpetuating cycle which promotes a mediocre product line that offers less than the best possible performance. Such a situation is bad for Apple's medium- and long-term outlook. One can only hope Gilbert Amelio will diagnose the problem quickly.

Bill May, clinical instructor
Department of Pediatrics
University of California at Los Angeles

Amelio = Italian Stallion?

I am among the millions of loyal Mac users who wouldn't trade their Mac OS for a Windows NT machine in a million years. However, I must concede my fear that the perception of Apple as weak and dying has got to make it more and more difficult for businesses and new computer buyers to put their faith in Apple. Yes, I even walked down the PC aisle at the local computer store a few weeks ago. But this time I felt less contemptuous than I have in the past. I need (and I believe the rest of the computing/investing/buying world needs) to see some excellent, powerful, successful things coming from Apple in the very near future in order to build our confidence and to brighten our hope that Apple is making the right moves.

I need to see Apple making commitments to developers by following through on its support of Apple technologies. I need to see Apple take advantage of other companies' R&D rather than shunning it all because it didn't come from its own R&D staff. In short, I need to see something good.

I am going to hang on as long as I can, but I fear someday being required to work on a Wintel system and give up all the joy and capabilities I have come to expect on my Mac. I'd love to see a "Rocky III" sort of comeback for Apple.

James A. Medema, technical writer
Business Brothers Software Products Inc.
Minneapolis

Knife digs MTV

Your Mac the Knife column (04.01.96, Page 94) really took me back to the good old days. It is good to see that you have a sense of humor and knowledge of trivia such as your "Video Killed the Radio Star" reference. I always envisioned the Knife as being one of those guys who thumbed their nose at MTV (though it has become a pretty pathetic shell of what it once was). Anyway, thanks for throwing me back in time for a few minutes and, again, for consistently having the best Mac column in the business.

Andrew Meyers, art director
Meyers Publishing
Van Nuys, Calif.

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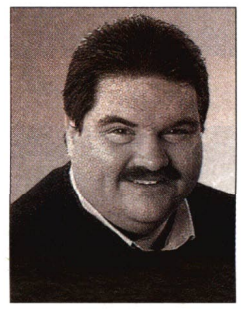
THE MAC MANAGER DON CRABB

Mac eats Windows' dust with new Visioneer release

We all have our favorite third-party software and hardware vendors. One of mine is Visioneer Communications Inc. This little company ran with the simple idea of scanning the paper that buries our desks and getting it quickly into our desktop machines so we can use both the text and the graphics. Visioneer's PaperPort and PaperPort Vx put the Macintosh at the leading edge of technology and helped show one more reason why the Mac OS was superior.



Despite all its success on the Mac, the realities of the Intel-standard PC marketplace have hit hard at Visioneer. While the PaperPort and PaperPort Vx were initially driven by sales to Mac buyers, that's all changed over the past six months.

With Windows sales now accounting for two-thirds of Visioneer sales, we see another clever, even outstanding Mac product slipping into the Windows camp. The next major Visioneer product release, scheduled one day before the opening of PC Expo in New York (June 17), will be Windows-only, at least initially.

And as Eric Zetlin, the PaperPort product-line manager just told me: "We're not sure when we'll do a Mac version. It's all about recovering our development costs, and the Windows market and our PC partners makes that much easier. This is an especially difficult thing to swallow for Mac folk like me."

Redefining evangelism

If anything should be clear to all of us right now, it's this: Apple simply cannot invent, develop, market and sell all the products we want and need. The only sensible way to fix this product dearth is an aggressive and clearly conceived evangelism program for third-party products. While that program shows some signs of being engineered inside Apple even as I write, it needs to cut through the organizational nonsense inside and outside Apple that has prevented the company from creating effective third-party co-marketing, development and even OEM bandwagons. The new program must make it easy for Apple to champion, co-market and co-develop products that will help define it in all its targeted markets.

Paper trail

Visioneer is a good example of how the old Apple third-party effort failed at these tasks. Apple, unlike Visioneer partners Hewlett-Packard Co. and Compaq Computer Corp., was unable to see the value of supporting the PaperPort and tying it into the Mac OS.

Visioneer tried hard to get Apple on board. It attempted to interest the company in selling an Apple-branded PaperPort as well as to work with Apple to develop additional Mac OS PaperPort software links. But a deal was never done, largely because too many product evangelists and product managers spoiled the broth.

Meanwhile, HP's and Compaq's PaperPort-based products are doing quite well. And Visioneer's next important product, which includes some damn-clever linked applications that would have been a big win in Apple's key markets, will be Windows-only — unless Apple can change, and change faster than I can write. □

Don Crabb welcomes comments at his Internet address decc@cs.uchicago.edu. You can also check out his home page at http://cs-www.uchicago.edu/~decc/.

"Marketing is trying to figure out if our technology is new, emerging or just pushing the envelope."

Comments? Ideas? Contact Eli at elitoons@aol.com

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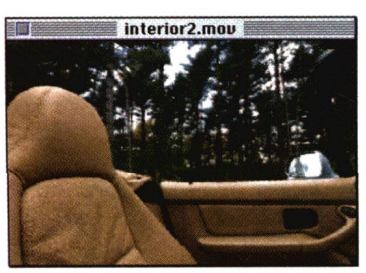

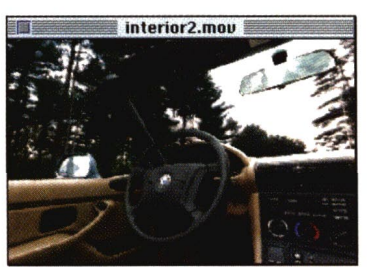

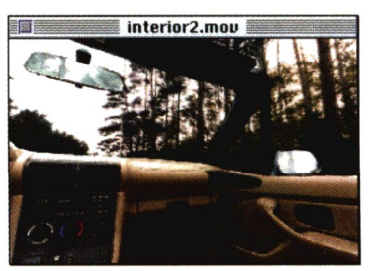

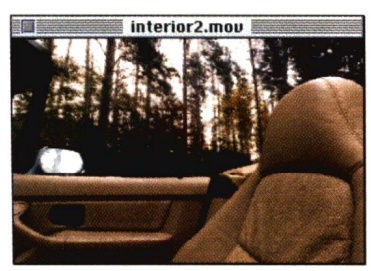

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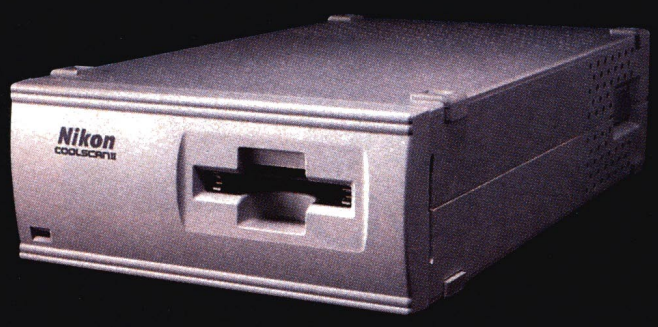

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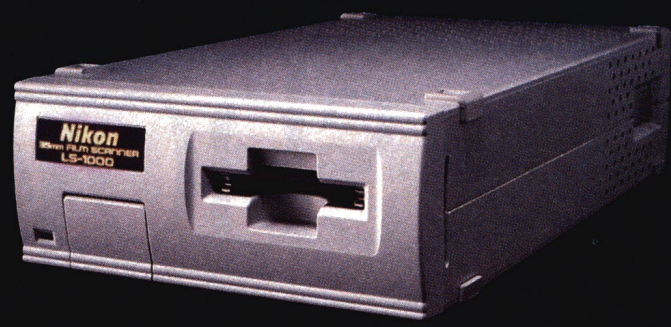

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MacWEEK Guide to Digital Imaging

GIAMPIERO BENVENUTI

MacWEEK looks at the array of digital cameras that are attracting the eye of photographers today. We examine studio, field and consumer cameras, take a behind-the-lens look at the technologies involved, and find out how creative one photographer thinks he can be.

Digital cameras starting to click with photographers

By Michael Miley

Despite high costs and transition difficulties, digital photography has made significant strides over the past year. Faster and more-sensitive cameras are allowing field professionals to use the technology for portraiture, for newspaper photos and even to capture movie stills on Hollywood film sets. And while the consumer market remains slow because of cost and output issues, entry-level cameras are now being used in business for data-collection purposes.

Buying a studio, field or even consumer-level digital camera should not be a snap decision. "What's the output going to be? That's the first question to ask," said John Larish, author of five books on digital photography and principal of Jonrel Imaging Consultants of Rochester, N.Y. "Know that you're not just buying a camera, but a technology, including the software that comes with the camera. Consider the whole process when buying, from input to computer platform to output."

In the studio

Studio photographers — those who shoot high-resolution product and still-life photography — are the best-equipped to deal with process issues, since they work in a highly controlled environment. So it's not surprising that the biggest inroads in digital photography are among their ranks.

Offerings include studio cameras that scan using a trilinear array. These cameras, which range in price from $9,500 to $30,000, include the PhotoPhase Plus from Phase One United States Inc., the Dicomed Digital Camera Back from Dicomed Inc., the three-shot Leaf DCB II and one-shot Leaf Catchlight cameras from Leaf Systems Inc., and the Carnival 2000S from ScanView Inc. One-shot cameras include the KanImage Digital Photography System from KanImage Inc.; the Kodak Professional DCS 465 Digital Camera Back from Eastman Kodak Co.; and the Sony DKC-5000 (CatsEye), a trisensor offering from Sony Electronics Inc.

"Exposure times with the Phase One high-res cameras have come way down as they have moved up in light sensitivity, from an ISO of 50 to 800," said George Rabito, president of Digital Photo Imaging Inc., a full-service studio in New

See Digital cameras, Page 30

TECH ANALYSIS

Not all digital cameras are created equal

By Bruce Fraser

While they still have a long way to go before they supplant film, digital cameras are fast becoming entrenched in various market niches, and it's clear they aren't a fad. But the term "digital camera" is really an umbrella that encompasses several technologies, each of which entails specific compromises.

One property digital cameras share with scanners is they turn light into pixels using some kind of CCD (charge-coupled device) detector. As with scanners, digital cameras can capture color in one pass or three, but the needs and expectations we associate with cameras are quite different from those we associate with scanners.

One pass at color

Scanning-back cameras, such as Dicomed Inc.'s Digital Camera Back, use a linear CCD array similar to the ones found in scanners to build an image one row of pixels at a time. Cameras such as these are basically a flatbed scanner placed in the film plane of a conventional large-format camera. In most cases, they use a trilinear array with three rows of CCD detectors — one each for red, green and blue. The array moves across the film plane just as the scanner head in a one-pass flatbed scanner moves across the scan bed; with each step it captures an entire row of RGB pixels.

The major limitation of scanning-back cameras is the exposure time required. A full-frame exposure typically takes *minutes*, rather than the fractions of a second we traditionally equate with photographic exposures. The practical implications are twofold: Scanning backs are unsuitable for shooting moving subjects, and they aren't compatible with traditional photographic strobe lighting — instead of a flash, they need a strong, continuous light source.

Three passes to color

The advantage scanning backs have is high resolution; they offer much higher resolutions at lower cost than the other fundamental digital camera sensor technology, the area-array CCD.

The area-array CCD found in most digital cameras captures an entire two-dimensional picture at once, rather than one row of pixels at a time. Each element in the detector captures a single pixel. To capture color, however, a compromise is necessary. The easiest way to do so is to make three separate exposures through red, green and blue color filters. This approach, analogous to a three-pass scanner, is typified by Leaf Systems Inc.'s DCB II. It allows photographers to use conventional strobe lighting, but, like a scanning back, it isn't suitable for moving subjects, since the three color planes would appear out of registration.

The majority of area array cameras place color filters directly on the CCD array, so that some elements in the array capture only red, some only green and some only blue. Eastman Kodak Co.'s DCS Professional series of cameras, for example, use a checkerboard pattern with two green pixels for each red and each blue pixel because most of the luminance information is in the green wavelengths. The missing color data is interpolated from neighboring pixels. While this approach produces a camera that can capture color images using exposure times similar to those of film, the compromise is that the color interpolation can give rise to brightly colored artifacts, particularly on fine details.

Other approaches to color interpolation seek to avoid this problem. The Leaf Catchlight, for example, uses four different-colored filters arranged in a random pattern to capture a raw image that can then be post-processed using one of four algorithms, each of which contains a different trade-off between image sharpness and artifact suppression.

Polaroid Corp.'s new PDC-2000 series (see review, 04.29.96, Page 33) uses still another approach. A specially designed sensor contains rectangular pixels that are twice as tall as they are wide, arranged in a 1,600-by-600-pixel matrix. The filters have a much broader band-pass characteristic than is usually found in scanners or digital cameras, so the red and green channels contain more of the luminance information that, on other devices, is confined to the green channel. The filters are arranged in alternating red, green and blue pixels.

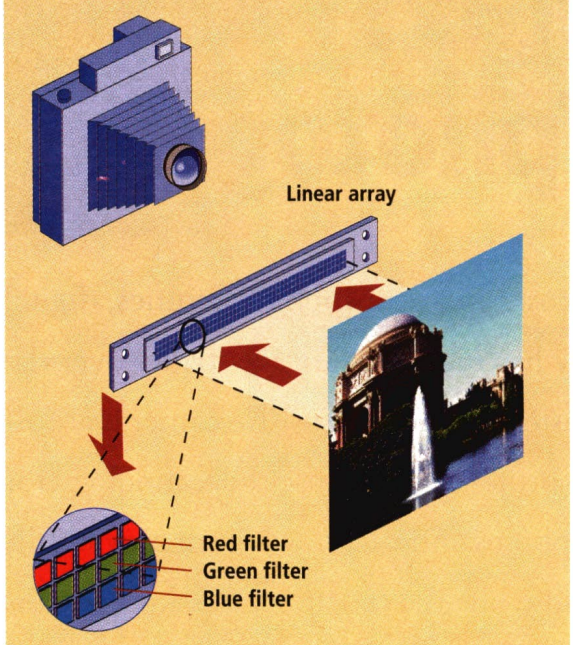
The accompanying Polaroid software can process the raw capture data to two resolutions: 800 by 600 pixels and 1,600 by 1,200 pixels. At 800 by 600, the horizontal pixels are paired to form square image pixels. Since each group has a pixel of the missing color on either side of it, relatively little color interpolation is needed to form the full-color image. In the 1,600-by-1,200-pixel mode, the vertical pixels are doubled and the two missing colors are interpolated.

A perfect take

The ideal would be to build a digital camera that could capture a full-color image in a single shot without resorting to color interpolation or pixel doubling. The obvious way to do this would be to build a three-chip camera, dedicating one area array to red, another to green and a

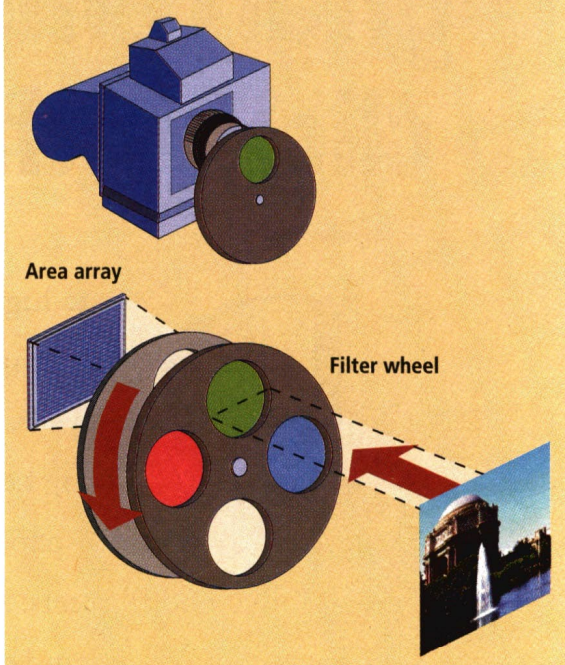
See Tech Analysis, Page 28

Scanning-back camera



A scanning-back camera uses a trilinear CCD array, similar to those found in one-pass flatbed scanners, to capture full-color image data one row of pixels at a time. The array is made up of three strips of sensors with red, green and blue color filters. Since each pixel is made up of true full-color data, scanning back cameras can capture colors more accurately. Inexpensive high-resolution linear arrays allow scanning backs to produce much higher-resolution images than other technologies, but the scanning time runs to minutes, so they can't photograph moving subjects or use strobe lights.

Three-shot color camera



In three-shot cameras, an area array captures a monochrome exposure in a single flash. To capture color, the camera makes three sequential exposures through red, green and blue filters, which are then combined in software to make a full-color image. The three exposures make such cameras unsuitable for moving subjects but can use strobe lighting. Resolution is limited by the size of the array – area arrays are more expensive than linear arrays.

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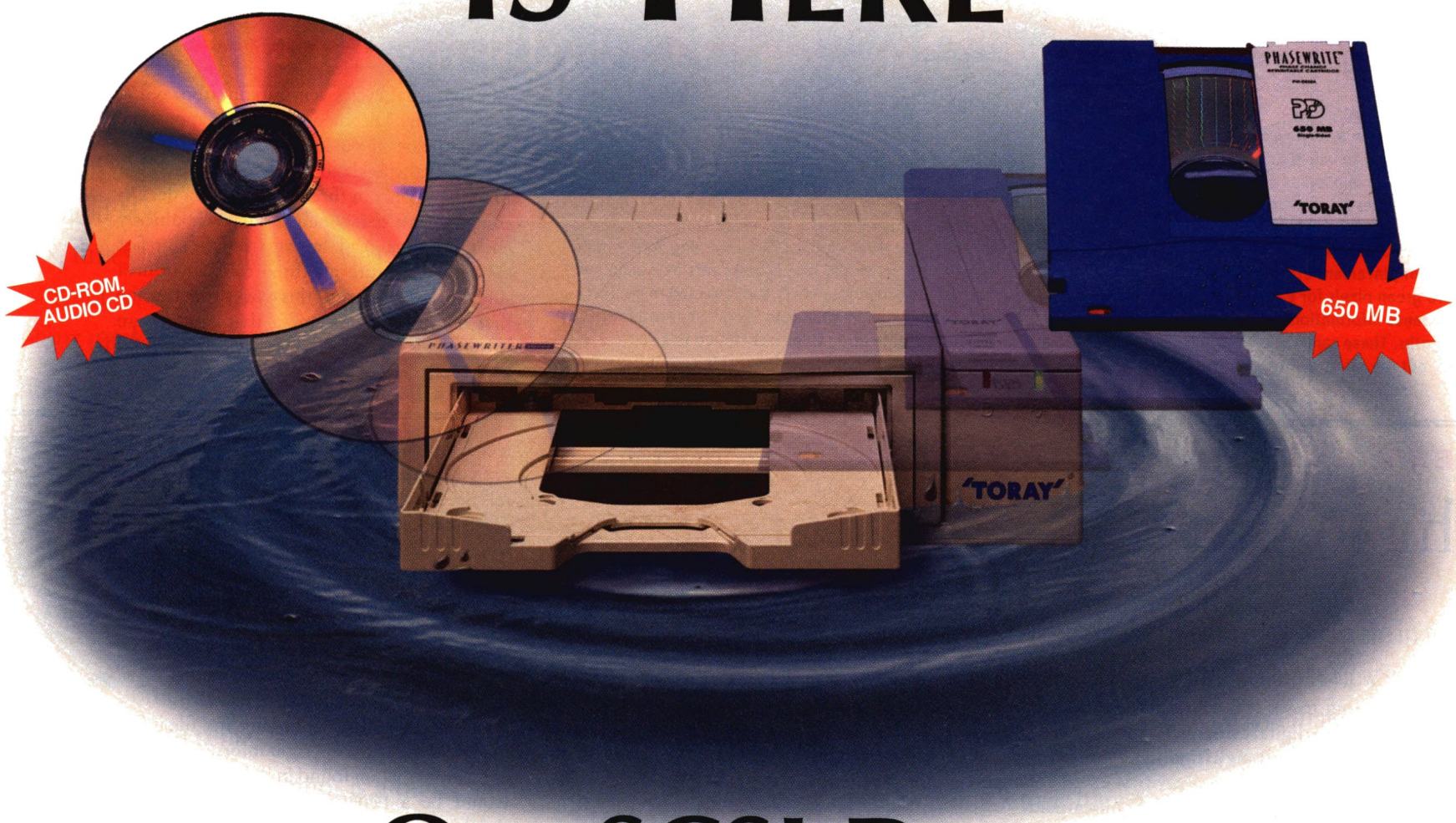

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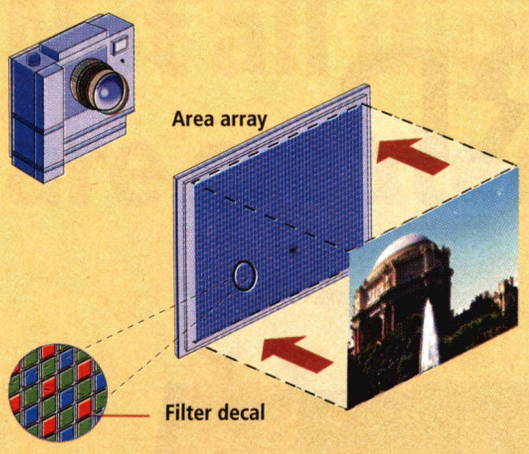
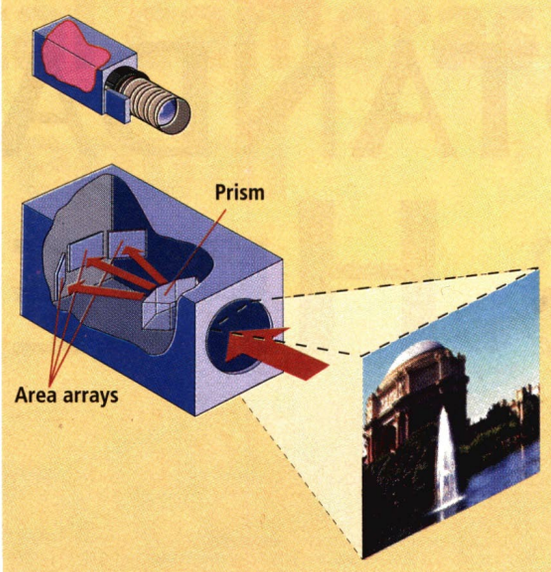
One-shot color single-chip camera



To capture color in a single exposure, single-chip cameras use an area array to which red, green and blue color filters have been applied as a decal, so each element in the array captures pixel information in only one of the three colors. The information for the two remaining colors is interpolated from neighboring pixels. There are various schemes for placement of the color filters: A common one uses two green pixels for each red and blue, since most of the luminance information is concentrated in the green wavelengths. These cameras offer true one-shot color capture, but the interpolation can often lead to artifacts.

One-shot three-chip camera



In a one-shot three-chip camera, incoming light is split into its red, green and blue components by a prism, and each of the primary colors is then directed to its own area array, providing full-color single-shot capture. The expense of area array chips has limited this approach to lower-resolution cameras, often using camcorder chips.

JOHN FARNSWORTH

Tech Analysis

From Page 26

third to blue, with the incoming light being split into its color components using a prism. So far, however, the only three-chip cameras built use low-quality camcorder sensors, which transfer data one line at a time, rather than the more expensive frame-transfer CCDs preferred for still-image capture. ActionCam, the color one-shot camera from Agfa, a division of Bayer Corp., is a three-chip camera, but it uses two of the chips to capture green, and the third has the red and blue filters to provide the missing color data, which is still interpolated.

Dicomed's new BigShot 4000 uses yet another technology. A tunable liquid crystal filter is placed in front of the camera lens, and during an exposure it cycles very rapidly from red to green to blue. Dicomed has yet to demonstrate this technology in public — the camera was previewed at the Seybold Seminars Boston 96 in March, but only in three-shot color mode. Dicomed claims that the filter can cycle quickly enough and can read the data from the chip fast enough to capture all three colors within a single-flash exposure. If this works, it will be the first one-shot color camera that captures an image made up entirely of real tricolor data for each pixel, with no interpolation required. □

GUEST EDITORIAL SETH RESNICK

Through a photographer's lens

While returning home from a lecture on digital technology in Chicago, I could not resist the urge to check into the office from 28,000 feet. An editor called to ask if I would be willing to write a column about my experience with digital cameras. Coincidentally, I had recently had an assignment using a high-end Nikon E2s. It was my first extensive experience with a $28,000 electronic camera.

For me, photography has always been a silver-sensitized process with complete artistic control aided by a ton of gear and an assistant to help carry it all. The new E2s field camera, co-developed by Nikon Inc. and Fuji Photo Film USA Inc., was easy to use and definitely a lighter load than I typically carry on an assignment. My assistant was grateful, but I felt like I completely lost the creative artistic control — the very reason I chose photography as my profession.

I would hope to see digital cameras offer more creative control.

I quickly discovered the process was not digital photography at all but rather digital still video. Instead of being worried about the normal f-stop, ASA and shutter speed specs, I found myself confronted with a nomenclature consisting of NTSC, white balance, power supplies and playback.

One of the advantages of the E2s is that it is a lens-interchangeable SLR-type digital camera. It looks and feels very similar to the Nikon N-90 I use every day, and all my exotic Nikon lenses were completely interchangeable with the E2s.

But the area of the camera that offers the most brilliance and most stupidity is the automatic white balance feature. Essentially, the camera contains a built-in color temperature meter and autofiltration, which is a true godsend to photographers like me who are faced with a wide mixture of funky lighting. But, clearly, the designers of the camera never talked to photographers when they devised this built-in color temperature meter.

The ideal scenario would have been a digital readout of corresponding color temperature and a mode that would allow the photographer to adjust. Many times I want the so-called wrong temperature for the effect. The camera fails miserably in this area because it always assumes the photographer wants a perfect white. During one scene, we went to the extent of setting up four strobes with gelled red light to complement the green cast of some visible fluorescent light. We shot 30 or so images on film and with the digital camera. On film, the images were composed of wonderful strong reds and vibrant greens, whereas the digital camera automatically color-corrected to basic white light.

I was constantly finding other design flaws. With a film-based camera, the moment the shutter is pressed the image is permanently captured on silver. We found out the hard way that by simply pressing buttons in the dark, we reformatted a disk by mistake. I was surprised to find that there was no means of locking key buttons. I also needed my traditional notebook and pen to keep track of subject matter — there was no means of picture identification, digital captioning or built-in electronic copyright stamping.

In the future, I would hope to see digital cameras offer much more in the way of creative control. It would be helpful to have an LCD readout of the current color temperature with true manual manipulation allowed. Typical camera features such as multiple exposure capability and high-speed motor drives, all necessary features, are currently left out of digital cameras. A small keyboard to attach a digital file, allowing captioning and file information along with copyright information, such as file information found in Adobe Photoshop, would be a benefit. The camera software should allow for image compression with a variety of choices beyond basic JPEG. Cards or storage in the 100-Mbyte range would mean less need for compression technology and thus allow for greater resolution. Batteries without memory problems that could power the camera for four to six hours, even in the cold, would also be helpful. While I'm wishing, I would also love to see a camera with a built-in cellular phone and modem so that images could be transmitted directly from the camera.

Although I am fascinated with digital cameras, I am also more convinced that the resolution, color saturation and creative control offered by traditional film is not about to be replaced any time soon by digital cameras. The digital technology was impressive and image quality was better than expected, but I was left with a very real feeling that the engineers spent way too much time on the computer side of development and not enough time talking with photographers about basic features. As a techno junkie, I would love to own a digital camera, but as a photographer, I'm not about to plunk down $28,000 for the opportunity. □

Seth Resnick is a Boston-based free-lance location photographer specializing in corporate and editorial photography. He has been published in more than 2,500 publications worldwide.

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Jerry Pournelle, a featured columnist for *Byte* magazine, stated in the April issue, "The User's Choice Award for this year goes to the ViewSonic Professional Series PT810..." Discussing the PT810 in the March issue, he said, "You'll have to fight me to get this monitor away from me. I am literally sitting here wondering how I got along without it all these years...Highly recommended."

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George Rabito of Digital Photo Imaging used the Phase One PhotoPhase Plus attached to a Sinar P2 4-by-5 camera with a 65mm/90mm lens and a Profoto 1,200-watt HMI. The resulting 30-Mbyte file was retouched in Photoshop.

Digital cameras

From Page 25

York whose clients include Estée Lauder.

To do his principal studio photography, Rabito uses PhotoPhase Plus, a 5,000-by-7,200-pixel scanning camera back attached to a Sinar P2 4-by-5 camera. Images are processed on his Power Mac 7100/80 with 104 Mbytes of RAM and a 2-Gbyte hard drive.

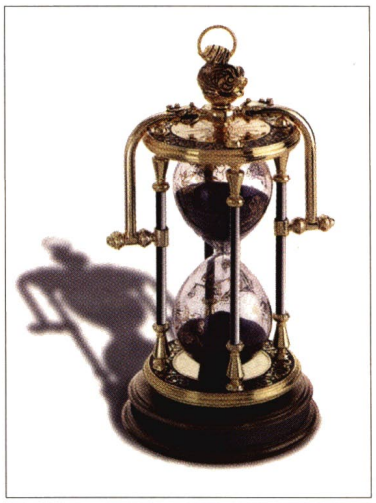
Rabito said he finds that going digital is a costly process, but there's much better quality control from start to finish. He said he still finds that he has to educate both photographers and clients about their expectations. "Photographers look for the grain and it's not there," he said. "I tell them to focus on the output, that they'll love what they get. And they do. And clients want cheaper prices. I tell them to focus on the time they've saved. They're getting their job in a day when it used to take a week."

French Studios Inc. of Marion, Iowa, a commercial and industrial photo studio and lab, uses ScanView's Carnival 2000S camera back on a medium-format Hasselblad, a unique studio solution in that it offers both single and multishot modes at 2,048-by-2,048-pixel resolution. The camera is ideally suited for moving targets and still subjects.

"We've tested a lot of cameras, including the Kodak DCS 460, the Phase One PhotoPhase and the Dicomed Digital Camera Back," said French Studios Vice President Ronald French. "We're most impressed with the Carnival 2000S because of the way it handles some of our more difficult jobs."

A portion of the work at French Studios is photographing architectural renderings that have marker and color-pencil work. "It's very hard for photographic film to record those colors with any fidelity," French said. "The greens, for example, go reddish brown on photographic film. With the Carnival, we can capture colors digitally that film cannot. We're blowing the architects' minds. What's more, the color balance is so neutral that running it through a color-management system seems virtually unnecessary."

Higher-quality and reduced processing time are two of the reasons Woodbury & Associates Photography Inc. in Fort Lauderdale, Fla., has gone digital. Another is its goal to turn the company into a digital photo fulfillment center.



Mark Woodbury of Woodbury & Associates used the Dicomed Digital Camera Back on a Sinar P2 4-by-5 with a Sinaron 300mm lens and Broncolor HMI 575 (3) lighting. The resulting 50-Mbyte file was retouched in Photoshop.

For two years, the company has used a Dicomed Digital Camera Back on a Sinar P2 4-by-5 for high-resolution product photography. "Our campaign is 'Do it once, do it digital,' " said Mark Woodbury, president and CEO. "For international clients, we used to dupe product photos some 30 times for 30 countries. Then, each of them would have to scan each piece of film, diminishing the quality and the standard look. Now, we send them their images on a CD-ROM and it eliminates all that."

On-location photography requires a one-shot camera that's fast enough to stop motion and can be used in a variety of lighting conditions. Field cameras are designed for journalists, catalog publishers, retail-chain advertisers, and those doing portraiture and multimedia work.

In the field

Digital field cameras, which range in price from $9,500 to $29,000, include the Kodak DCS 420 and 460, and EOS•DCS 1, 3 and 5 (the EOS•DCS 1 and 3 are also available from Canon USA Inc.); the ActionCam from Agfa, a division of Bayer Corp.; and the E2 and E2s Digital Still Camera Systems from Nikon Inc. (see story, Page 28).

"We use a couple of Kodak/Canon EOS•DCS 3 [1,012-by-1,268-pixel] cameras for deadline situations any time it's impossible

See Digital cameras, Page 32

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EASTMAN KODAK CO.
Kodak Professional DCS 420 Digital Camera: $10,995;DCS 460: $27,995; EOS•DCS 1: $28,995; EOS•DCS 3: $16,000; EOS•DCS 5: $11,995
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NIKON INC. ELECTRONIC IMAGING DEPARTMENT
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EASTMAN KODAK CO.
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KANIMAGE INC.
KanImage Digital Photography System for Macintosh (without lens): $29,995
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LEAF SYSTEMS INC.
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POLAROID CORP.
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SCANVIEW INC.
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SONY ELECTRONICS INC. BUSINESS AND PROFESSIONAL PRODUCTS GROUP
Sony DKC-5000 (CatsEye): $10,950
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Ronald French of French Studios created this architectural rendering (above) with a ScanView Carnival 2000S camera back on a medium-format Hasselblad. He used a 120mm lens and Speedotron strobe lighting. The resulting 11-Mbyte file was retouched in Photoshop. At right is the scanned conventional photo.

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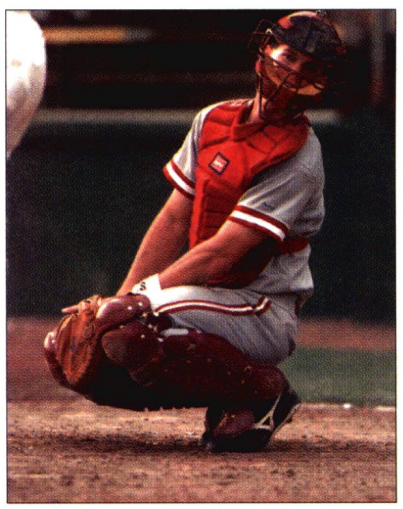
Digital cameras

From Page 30

to process the film right away, said Gary Fong, director of editorial graphics technology for the San Francisco Chronicle. "This might be an election night or last year's Super Bowl, where we shot about 400 frames on PC cards, using a modem to send the images in. The pictures were great, though in low-light situations we'll sometimes see artifacts, which we clean up in [Adobe] Photoshop."



Chris Stewart of the San Francisco Chronicle photographed Stanford Cardinal catcher A.J. Hinch using the Canon/Kodak DCS 3 with an EF 300mm lens, an aperture setting of 1/1,000 and an f-stop of 2.8 using daylight. The resulting 3.7-Mbyte file was interpolated to 9 Mbytes and retouched in Photoshop.

Once the photo is on the page, however, Fong said it's hard to tell the difference between digital and film. "With an 85-line screen for the newspaper," he said, "we can blow up 4.5 Mbytes of data to six columns of color (the width of a full broadsheet) and it still looks good."

Kory Addis of Boston-based Kory Photography uses both the trilinear scanning StudioCam (which boasts resolutions of up to 4,500 by 3,648 pixels) for high-resolution corporate advertising and still-life work, as well as its sibling, the one-shot ActionCam field camera, for travel images and portraits. The ActionCam, which captures images at 1,548 by 1,148 pixels, is a standard Minolta RD-175 with an autofocus lens. It comes with FotoTune color-management software; FotoFlavor, a series of tone curves; Cumulus, a photo database; and Photoshop LE, a Photoshop acquire module.

"I find it as good as film and better in some respects, but I see it as just another camera in my camera bag," Addis said. "While 70 [percent] to 80 percent of my clients still request film, the advantages to going digital are great. You can see your images instantly and place them more eas-

See Digital cameras, Page 34

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Chinon ES-1000 Pocket Digital Camera: $499; ES-3000 Advanced 24-bit Color Digital Camera: $999
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CONNECTIX CORP.
QuickCam: $149
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DYCAM INC.
Dycam Digital Color Zoom Camera 10C: $999
Chatsworth, Calif.
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EASTMAN KODAK CO.
Kodak Digital Science DC40: $700; DC50: $1,000
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FUJI PHOTO FILM USA INC.
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Digital cameras star on film sets

When Hollywood studios hire a still photographer to shoot all the publicity photos for a film, one of the people they call is Phillip Caruso of Caruso Studios in Averill Park, N.Y. Caruso's movie credits include "Cape Fear," "Forrest Gump," "Casino" and "Twelve Monkeys," and he's just added another film to his portfolio, "That Thing You Do!," starring Tom Hanks. Due out in November, the film is about a rock band of four that rises to fame in 1964.

Phillip Caruso of Caruso Studios took this photo using a Nikon E2s Digital Still Camera System with a Nikon 35mm lens, an aperture setting of 1/125, an f-stop of 8.0 and HMI daylight balance. The resulting 3.67-Mbyte file was retouched in Photoshop.

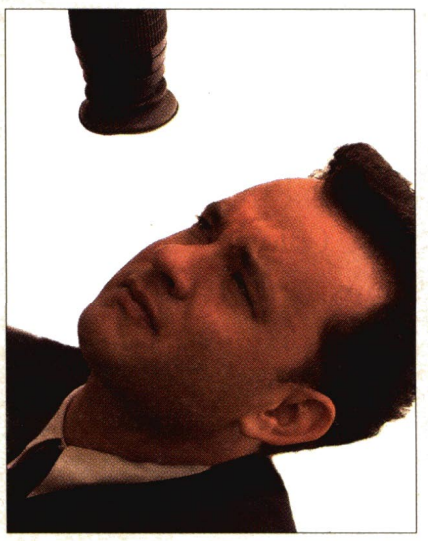
"As far as I know, I'm the first still photographer around who's used a digital camera to capture on a film set," Caruso said.

For shooting stills on the set of "That Thing You Do!," Caruso used an E2s from Nikon Inc. The camera is similar to a Nikon high-end 35mm SLR camera and uses standard lenses. It offers continuous shooting at 3 frames per second for up to seven frames, automatic and manual white balance options, and an ISO sensitivity rating of either 800 or 1,600 (for lower light conditions). Resolution is 1,280 by 1,000 pixels, which yields a 3.67-Mbyte uncompressed file. (Files can be compressed using one of three levels of JPEG compression).

The E2s is fully portable and uses 15-Mbyte flash-memory PC Cards for up to 43 images in Normal mode (or 84 under maximum compression) and a rechargeable nickel-cadmium battery good for a maximum of 1,000 shots. An RCA video-out plug gives an NTSC/PAL signal. The Nikon Browser software automatically gives you thumbnails of your images.

"I read about the prototype last year," Caruso said, "and after months of making phone calls, Nikon contacted me with a tech rep, who came out onto the movie set I was working on at the time. He brought the E2s, a PowerBook and a 300-dpi dye-sub printer. I spent a day shooting with the camera. At the end of a shooting, I'd print out some 4-by-6-inch prints. I was bowled over. It was just as good as film. That's when I knew I had to go digital."

Caruso sold some of his older photography equipment to buy the camera, a few flash-memory cards (which were $1,500 each) and two NiCad batteries. Total investment for the digital camera setup: $20,000. Images were stored on a PowerBook 5300c with 48 Mbytes of RAM and a 750-Mbyte hard disk. Backups were done with a SyQuest Technology Inc. EZ Drive using 135-Mbyte cartridges. The PowerBook sat on a cart on the set; after each PC Card was loaded with images, Caruso said he downloaded the images to the Mac using a QuicKeys macro while shooting with the other card. Downloading took about 30 seconds, while a button on the E2s instantly reformatted the other PC Card for the next round of shots.



Caruso took this photo using a Nikon E2s with a 300mm lens, a 1/500 aperture setting, a 16 f-stop and daylight exterior lighting.

"One of the great things I'll do when I'm shooting is tap directly into the director's monitor, where he views the ongoing videotape of the film," Caruso said. "I could get instant feedback on my shots, and Hanks (who stars in and directs the film) could give me his approval. It worked great." Caruso took about 4,500 digital shots on the set, as well as 400 rolls of regular film. "I've also done on-set [Adobe] Photoshop editing, where I edited a light stand out of a portrait shot of Tom Hanks with one his co-stars. It took about 15 seconds."

Because of a few quirks with the digital technology, Caruso said he sees the E2s as an adjunct to his film work. He's clamoring for less expensive and higher-storage PC Cards. Another drawback is the maximum f-stop (aperture value) of 6.7 on the E2s, which is only partially compensated for by the fast CCD (charge-coupled device) sensor in the camera.

"Film holds up better in a low-light situation for shadow detail," Caruso said. "Also, for a sound studio, the camera isn't soundproof (the instant return mirror makes a noise), so I revert to a regular camera for those situations."

Drawbacks aside, Caruso is sold and expects he'll use the E2s as much as possible in the future. "I'm pleased beyond my initial expectations," he said. "It's as good as any film coverage I've done. Color 8-by-10s done from slides of the photos look great, and so does stuff that's hit publication. I've cut a whole analog procedure out of the process, and the instant feedback on the set is unbeatable. Now I'm pitching digital stills for DreamWorks [SKG] and CBS with their techies. Their comments? 'Steven [Spielberg] should see this!' "

— By Michael Miley

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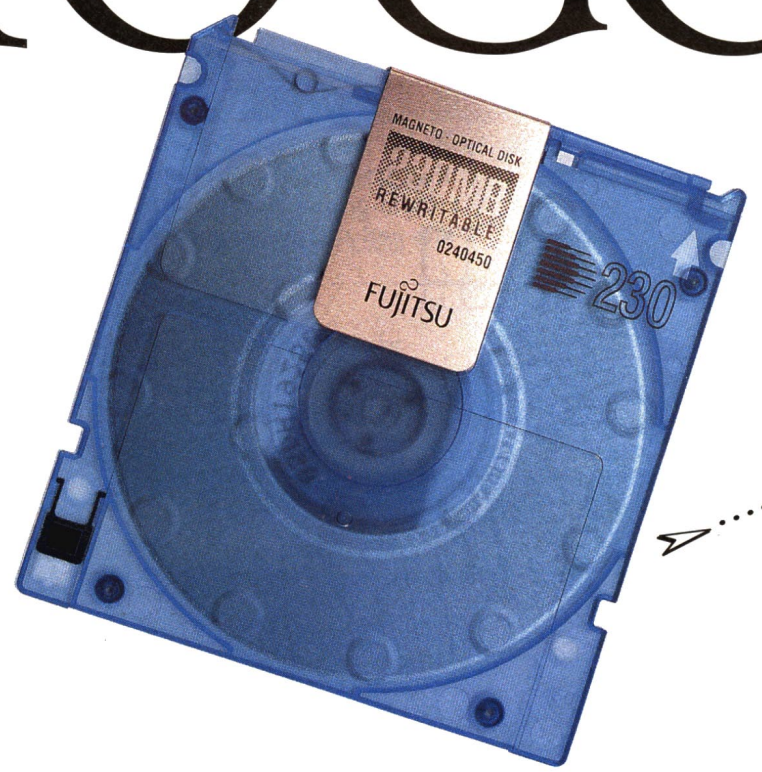

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Digital cameras

From Page 32

ily into the work-flow environment of art directors and designers. Everyone speaks the same language now; there are no more secrets."

For consumer consumption

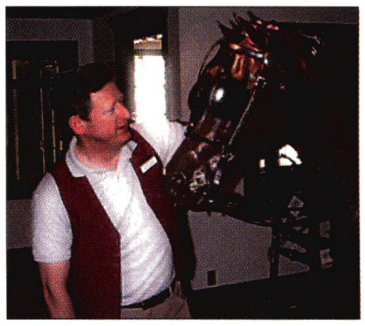
Color digital cameras for the consumer are still a bit of a misnomer, since pricing is still too steep for most end users (cameras range from $149 to $1,800), and image output can also be an expensive endeavor.

Photographer Kory Addis used an Agfa ActionCam with a 100-300mm Mamiya Zoom lens, a 1/250 aperture setting and a 6.7 f-stop with available tungsten lighting. The image was a 1.1-Mbyte compressed file, expanded to 5 Mbytes when retouched in Photoshop.

However, business users are taking to these cameras, and Web publishing is expected to expand the use of the consumer-grade cameras.

"Inroads are being made in business applications," said Kristi Holch, a digital photographic expert for InfoTrends Research Group Inc. of Plymouth, Mass. A few of these business uses include photojournalism, image databases (for insurance companies, for example) and site documentation (such as on a road crew documenting reports for the state).

Consumer cameras include the versatile Ricoh RDC-1 from Ricoh Corp.'s Consumer Products Group, which can store sound and video images as well as stills; the Casio QV-10 from Casio Inc.; the Apple QuickTake 100 and 150; the Dycam Digital Color Zoom Camera 10C from Dycam Inc.; the Kodak Digital Science DC40 and DC50; the Chinon ES-1000 Pocket Digital Camera and the Chinon ES-3000 Advanced 24-bit Color Digital Camera from Chinon America Inc.; the Fuji Photo Film DS-220 from Fuji Photo Film USA Inc.; and a true low-end consumer offering, the black-and-white QuickCam from Connectix Corp.



Brad Flickinger of Legend Publishing used an Apple QuickTake 100 with built-in flash. The resulting 116-Kbyte JPEG file was 910 Kbytes when retouched in Photoshop.

Dr. Steven J. White, assistant professor of emergency medicine at Vanderbilt University in Nashville, Tenn., is using his camera for site documentation.

"I use the Casio QV-10 to document physical findings in the emergency ward, both before and after repair," White said. "It could be a laceration when they come in or an infection that develops. We print out the photos on a Casio printer, and we also photograph X-rays and use the photos for slide presentations."

Brad Flickinger, principal of Legend Publishing Corp. of Cardston, Alberta, uses two Apple QuickTake 100s (now the 150) with two PowerBook 150 laptops for photos that appear in his community newspaper, as well as for real estate ads.

"We don't use conventional film because the cameras have saved us time and money," said Flickinger, who has used the QuickTakes for two years in all kinds of weather. "Since the QuickTake is a fixed-focus camera, you don't get depth of field. And if you blow up your images too much, they get grainy, though we can enhance our photos in Photoshop. You also don't get panoramas, so at sporting events we'll do sideline shots instead. But these cameras work really well for us."

Dr. Steven J. White of Vanderbilt University uses a Casio QV-10, backlit, to document physical findings, such as this X-ray of a cervical spine injury. The resulting file was 225 Kbytes.

Developing time

In the areas of resolution, handling and price, digital cameras continue to improve, and more photographers are making the move to digital technology — either to supplement or complement their traditional film photography. Film-based cameras don't seem to be on their way out any time soon, but in time, digital cameras may develop into more than just a technology for those looking for a quick fix. □

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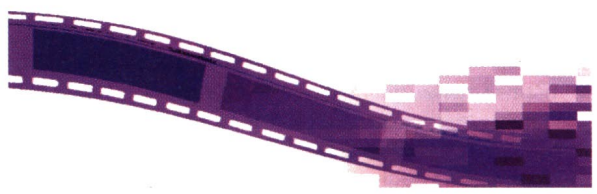

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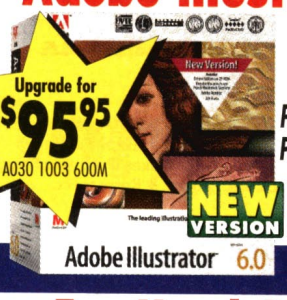

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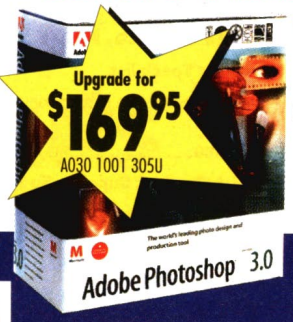

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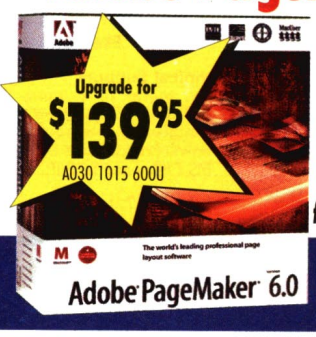

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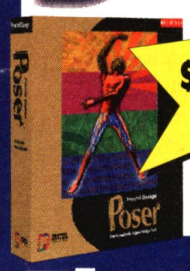

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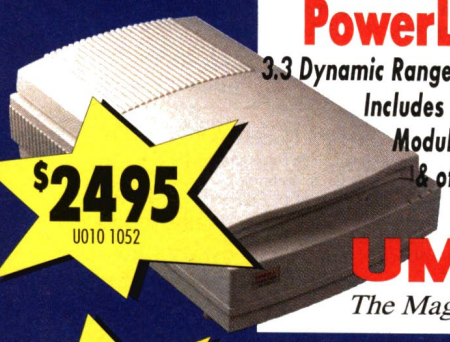

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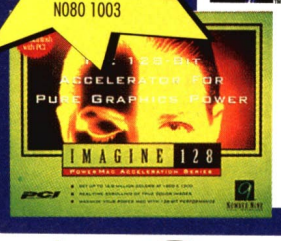

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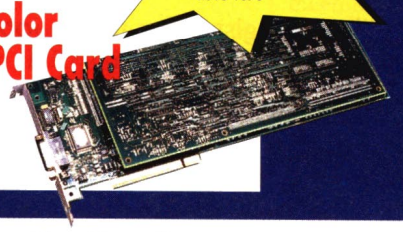

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Job# 13870-1 .....$20-$35 / hour

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Job# 10233 .....$15-17 / hour

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3-4 techs needed to test software localization project, verifying programs, working with translation specialists.

Job# 4441 ..... $15 / hour

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MS Access expert to design and tweak existing database, standardize data, perform queries, customize & generate reports.

Job# 4415.....$20 / hour

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Job# 4414.....$45 / hour

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Help Desk Assistant

Support end users at schools using client's custom internet access software. Assistance provided over the phone.

Job# 6716.....$10 / hour

Database Programmer

Complete redesign of a 4D database. Add procedures, write scripts.

Job# 7142.....$25 / hour

Technical Support

Troubleshoot printing and software problems Mac/PC network.

Job# 6820.....$25 / hour

Houston, TX

Technical Support

Work for a "Big Six" accounting firm. Mac platform, troubleshoot h/w, s/w, work with PowerBooks. Some DOS/Windows. Support MS Office and TCP/IP.

Job# 3667.....$30-35K / year

Los Angeles, CA

Technical Support

For Creative Services dept. Maintain, troubleshoot Macs & Windows machines. Work with scanners, Fiery printers, multimedia, the Web, A/V systems. Need graphics skills.

Job# 15361 .....$20-25 / hour

Technical Support

General h/w, s/w installation and maintenance. Strong Mac and PC knowledge required. Networking a plus.

Job# 15180 .....$17-20 / hour

Technical Support

3 years experience supporting office environment. Maintain mostly Mac network. Backup procedures, LAN/WAN experience helpful.

Job# 15420 .....$18-25 / hour

Technical Support

In Creative and Admin. depts. of architectural design firm. Support AutoCad, networking, UNIX, & graphic design software. Fast paced environment.

Job# 15399 .....$18-25 / hour

New Jersey

Mac Programmer

Working in C for Mac creating video data application. Software will be converted later for non-Mac OS and localized for Arabic.

Job# 3259 .....$30-50 / hour

New York

Systems Generalist

Mac network. Large Ethernet LANs. UNIX, NetWare, ccMail, and MS Office required.

Job# 10074.....$25 / hour

Help Desk

Tier 1 support for large publishing house. Quark, Illustrator, Photoshop & general h/w and peripherals issues.

Job# 8653.....$22 / hour

Orange County, CA

Macintosh Programmer

MS Solutions Provider needs work on comm part of their application. C++ & AppleScript. File transfer, management of PC/Mac & Mac/Mac conversion. Comm toolbox a must. FoxPro helpful.

Job# 3791 .....$30-120 / hour

Philadelphia, PA

Lingo Programmer

Work in Director for consulting firm.

Job# 5525 .....$22-24 / hour

Philadelphia, PA (Cont.)

PC Systems Specialist

Basic troubleshooting. Networking experience helpful.

Job# 5480.....$15 / hour

Help Desk/Product Support Specialist

Mac & Windows, handle service requests over phone and at end-user station.

Job# 1083.....$21-$24K / year

Help Desk/Product Support Specialist Team Leader

Mac & Windows, monitor service requests in the call center.

Job# 1083.....$28-32K / year

Translation Engineer

Mac & Windows. Program software localization utilities. Compile international s/w packages. Borland, Amiable RLM and ResEdit.

Job# 1083.....$30-35K / year

Philadelphia, PA (Cont.)

Quality Assurance Manager

Mac & Windows, work closely with engineering to ensure quality of product. Maintain, fix and generate OEM software.

Job# 1083.....$30-35K / year

Mac Programmer

3 yrs experience with C, C++ & Pascal. Code Warrior a plus. Working with AppleShare and TCP/IP protocols. Open Transport in client/server environment. Finance or brokerage knowledge a plus. Ongoing development and support of market trading software.

Job# 5665.....$60-90K / year

Phoenix, AZ

Network Consultant

Banyan Vines 5.5.4. Need to maximize transfer rates for Mac-Mac, Mac-PC and Mac-UNIX. Need consulting on best software for the job.

Job# 1059 .....$25-40 / hour

Mac Programmer

Aircraft simulation game. Think C and HyperCard for Mac required. Debug during final testing. 3D Audio and Focal Point a plus. Stats background needed because s/w collects data for research project.

Job# 1053 .....$30-50 / hour

Technical Support

For pre-press, h/w and s/w support. QuarkXPress, PageMaker, Illustrator, Freehand, Photoshop & MS Office. AppleShare, Ethernet, other network experience a plus. Relocation considered.

Job# 1057 .....$17-20 / hour

San Diego, CA

Database Administrator

Progressive multimedia firm needs experienced 4D programmer.

Job# 4031 .....$20-30 / hour

Lingo Programmer

Director professionals with at least a year of professional experience with Lingo, SQL or database experience a plus.

Job# 4051 .....$15-25 / hour

San Francisco, CA

Technical Support

Mac LAN with PC clones. AppleShare, Ethernet, UNIX, TCP/IP. Word, Excel, FileMaker, FrameMaker, PageMaker, Illustrator, Photoshop, QuickMail, Eudora, & Retrospect.

Job# 6575.....$17 / hour

Systems Administrator

Mac LocalTalk network, linked FileMaker Pro 2.2 & ACT! databases. Ethernet, FileMaker Pro 3.0, & dedicated server in future. Manage backups, 401K reporting, report writing for HR consulting firm.

Job# 6422.....$25 / hour

Sr. Programmer

Develop bibliographic database running on 32-bit Windows & Mac systems. C/C++ for Mac required. Experience with Toolbox, TextEdit, Script Manager, WorldScript and File Manager. GUI knowledge & cross-platform development experience is a plus.

Job# 6608 .....$25-50 / hour

Santa Clara, CA

Field Engineer

PC and Mac installation, repair & maintenance. Hardware and software testing, training & research.

Job# 4055.....$20 / hour

Software Localization Specialist

Localize software for 24 languages. Must have prior experience. Not a development position. Entry-level engineers will be considered.

Job# 4041 .....$40K / year

MIS/Data Systems Consultant

Consult on and construct a system (networked database or other) so any client station has access all account info for online publishing house. Customers should be able to dial into sales and place orders via the Web. Possible future web site development.

Job #4000 .....$25-50 / hour

Mac Programmers

C/C++, Code Warrior and MPW. Develop comm software. ISDN, modem technology, & comm toolbox a must. 5-6 perm positions including a Sr. Engineer.

Job #4277.....$50-75K / year

Mac Programmers

Using C++, Code Warrior and MPW. Multimedia graphics knowledge including QuickTime and QuickDraw required. Drag & Drop technology. Several long-term openings.

Job# 4284 .....$25-60 / hour

Technical Support

2 positions. Support customers using communications software to connect to multiple platforms. Internet knowledge needed.

Job #4286 .....$15-17 / hour

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GX TIPS AND TRICKS

Almost 50 QuickDraw GX fonts are now available. For more GX info, see http://www.ixmedia.com/quickgx/.

UniQorn 1.0 puts new twists on DTP with good GX tools

By Dennis Sellers

SoftPress Systems' GX page-layout program takes on the big guns of DTP.

Adobe PageMaker and QuarkXPress are the workhorses of the desktop publishing field, but an exotic design program named UniQorn may horn in on their turf. Its flexible presentation and typographical features alone may convince designers and publishers to give this new application some hard drive space alongside the mainstays from Adobe Systems Inc. and Quark Inc.

The United Kingdom's SoftPress Systems Ltd. has built its document processor around Apple's underused QuickDraw GX technology and its own object-oriented SoftPress Intelligent Document Architecture (SPIDA). The result is a different type of publishing application. UniQorn costs $399 until July 31, after which it will list for $895.

Flexible presentation

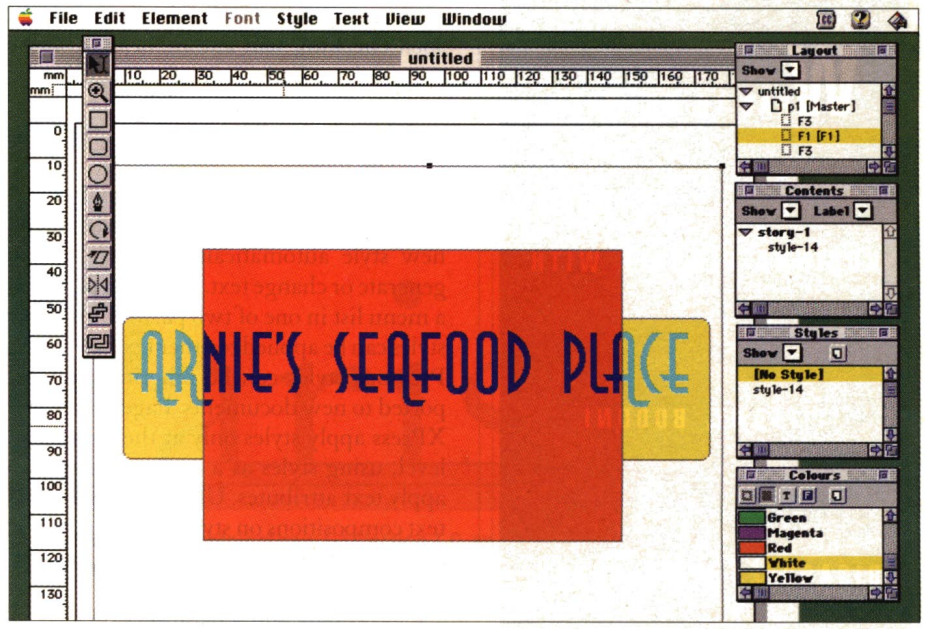
Like XPress, UniQorn uses a frame-based metaphor for page creation. But unlike similar applications, UniQorn provides "flexible presentation," which lets you create a document in one format and automatically reformat it in a different size or for a different medium. You can create an advertisement with a landscape orientation for one magazine, then instantly change it to portrait orientation for another publication. You could then mark up your document with HTML tags. By following a few simple rules during reformatting, your document's overall design stays intact as graphics adjust themselves and text reflows automatically.

Flexible presentation is possible because UniQorn views a page as a hierarchy of frames with shapes and sizes that can be either fixed or relative. Fixed frames, common in traditional page-layout programs, and their contents keep the same position and dimensions despite any change to the page shape. Relative frames, however, are tied to the page shape. Change the page shape and the frames change accordingly.

UniQorn, in a new approach, doesn't differentiate between frame types; frames can have many shapes and can hold either text or graphics. Because of its GX roots, all UniQorn frames can be skewed, rotated and mirrored; all contained text remains editable.

UniQorn uses a "child" and "parent" metaphor for creating frames. You can make "children" of existing frames by drawing them within another frame while holding down the Command key; frames can be added to or removed from the parent-child hierarchy using the Layout palette. A frame can be parent and child simultaneously, and you can change a frame's relationship in the family tree.

Any frame inherits default characteristics — style, color, text attributes and trapping — from its parent, although you can override inherited traits. Making frames children of other frames is optional; the default layout mode has frames relative to the page, as in XPress.



UniQorn's foreground and background color feature for frames can make text change color when overlapping a picture or background frame. ITC Anna is the GX font used here.

Typography

Any GX-based program offers typography of the highest quality. Using GX "smart fonts" with UniQorn lets you automate typographical functions that, before GX, were time-consuming or impossible. You can take advantage of alternate and swash characters, ligature sets, glyph substitution, true-drawn small caps, real fractions, superiors and inferiors, optical align-

See UniQorn, next page

For a review of LightningDraw GX, see Page 39.

score card

UniQorn 1.0

SoftPress Systems Ltd.
List price: $399*
Overall value ◆◆◆

With UniQorn 1.0, SoftPress Systems has developed a document processor unlike any other. Unsurpassed typographical features, timesaving trapping options and flexible presentation make UniQorn worth serious consideration by designers and publishers. The program suffers from some Version 1 shortcomings, such as the lack of true GX transparency and direct text import from word processors, but if Version 2.0 (slated for a fall release) addresses these issues, UniQorn could easily become a must-have multiple-media processor. Its QuickDraw GX requirements may bother some people, but if you're willing to experiment with GX (which will be rolled into Copland), UniQorn offers some unique capabilities.

Performance ◆◆◆
Features ◆◆◆◆
Ease of use ◆◆◆
Documentation/support ◆◆◆◆

**Introductory price through July 31; list price thereafter, $895 ($559 estimated street price).*

Key ◆◆◆◆◆ *Excellent* ◆◆◆◆ *Very good* ◆◆◆ *Good* ◆◆ *Fair* ◆ *Unsatisfactory*

NUpowr 603e card gives PPC boost to PB 500s

By Dale Coleman

Newer board offers low-cost upgrade alternative to new PowerPC PowerBooks.

Upgrading your Macintosh with a third-party processor isn't as attractive as it once was. New machines are more competitively priced than ever before, and they are still the best insurance against future incompatibilities.

But Newer Technology Inc.'s NUpowr, a 117-MHz 603e PowerPC processor board upgrade for 500-series PowerBooks, bucks this trend with a solid combination of low cost and very good performance.

The standard NUpowr board is $590 with no RAM; it's also available in a $795 configuration with 4 Mbytes of RAM and a $999 configuration with 8 Mbytes (all prices include an $80 rebate for the old 68040 board). We tested the 8-Mbyte card in a PowerBook 540c that originally had 12 Mbytes of RAM. The 540c's old '040 card included 4 Mbytes of RAM, so our upgraded 540c had a total of 16 Mbytes of RAM.

The RAM options highlight a major benefit of upgrading. Users who have in-

See NUpowr, Page 40

Accelerated for Power Macintosh
WHAT TO DO WHEN
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TIFFANY, BODONI
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UniQorn

From previous page

ment, font variations of weight and width axes, and more.

UniQorn and GX, teamed with Apple's WorldScript technology, let you combine multiple languages, even within the same text block. You can also include language settings as part of a style. Hyphenation and spell checking will automatically use the appropriate dictionaries for multilingual text proofing.

Other praiseworthy features in UniQorn include:

- Interactive style-sheet design. For text composition UniQorn creates and names a new style automatically every time you generate or change text. Styles are posted in a menu list in one of two palettes, and new styles can be applied to other text selections. Previous styles can be inherited and exported to new documents. PageMaker and XPress apply styles only at the paragraph level, using styles as a convenient way to apply text attributes. UniQorn bases all its text compositions on style. This, too, can be a timesaver once you've adapted to this new way of working.
- Trapping and separation previews. A "live" trapping preview lets you view enlarged traps with either full or partial on-screen color separations. Besides doing automatic trapping, UniQorn actually lets you preview CMYK separations, with trappings, on-screen. UniQorn currently can only trap graphics created from within the application itself or imported from Lari Software Inc.'s LightningDraw GX illustration program.
- Foreground and background colors. UniQorn accomplishes some interesting effects with frames. Each frame can have a foreground and background color; place text of one color in a frame with a different foreground color and the color of the text automatically changes where it overlaps the foreground color. This feature lets text change color where it overlaps a picture.
- Resampling graphics. UniQorn lets you resample graphics that have been resized during imports. Enlarge graphics for a more accurate on-screen display; reduce them for efficient memory usage.

UniQorn lets you manipulate GX "smart fonts" through the Font Extras palette and the Control palette. The Mr. Earl and Snowcaps font is shown in its default setting, with Alternate Character Set 2 activated and with skew and perspective applied.

On the other hand

Despite its innovative nature, UniQorn stumbles in some areas. There's no simple, direct "grouping" feature, and it doesn't provide links between separate files. Although it has controls for section and page numbering, this release lacks automatic page numbering and automatic generation of tables of contents. For these reasons, other programs are better for producing long documents.

UniQorn doesn't offer full color management yet. Its implementation of ColorSync provides consistent color control from device to device, but UniQorn's more traditional color tools aren't up to par with those of PageMaker. For instance, there's no one-step method of creating a tint from an existing color.

UniQorn's interface for assigning frame rules may be confusing to some. Also, creating Web documents is hampered by the inability to convert files to either GIF or JPEG, the inability to import HTML files, and the lack of support for HTML columns and tables. This limits a program that could otherwise be a natural for creating Web files.

> Flexible presentation and typographic and trapping features make UniQorn a perfect complement to PageMaker and QuarkXPress.

The lack of direct import translators for popular Mac word processors is another major gap. Currently, your best option is to import text with styling in the RTF format using Easy Open and translators from DataViz Inc. and Claris Corp.

While UniQorn has vastly improved Apple's user interface for accessing GX font features, your mind may boggle at the seemingly endless number of floating palettes. Its GX-rich features and flexible presentation options require some adjusting. Still, experienced desktop publishers, especially XPress users, should adapt quickly to UniQorn's interface.

Diehard GX fans will be disappointed in UniQorn's limited support for transparencies, one of QuickDraw GX's niftiest built-in features. LightningDraw GX and Manhattan Graphics Corp.'s Ready,Set,Go! GX 7.0 (see 08.28.95, Page 27), the other two standard-bearers for GX, let you create transparent colored objects, a process unavailable with either PostScript or traditional QuickDraw. UniQorn limits this feature to text interaction with foreground frame colors.

UniQorn also lacks a system for extending the program with add-ons such as Additions and XTensions. SoftPress said it is eyeing Apple's OpenDoc technology to fill that need, probably before year's end.

Its QuickDraw GX basis may cause some people to unfairly write off UniQorn; GX has an undeserved reputation as a bug-filled memory hog. It's true that GX requires 1.5 Mbytes of RAM, and you'll need at least 12 Mbytes of RAM on a 680x0 Mac or 16 Mbytes on a Power Mac to use UniQorn. However, since GX-based applications incorporate GX's system-level graphics handling, the programs themselves actually use less memory than their counterparts. (UniQorn needs about 1 Mbyte less RAM than either PageMaker or XPress.)

GX developers and users feel GX's memory overhead is a fair trade-off for improved printing, better color matching, easy document portability and other benefits. Additionally, QuickDraw GX 1.1.3 is relatively stable, and Version 1.2 is in the works. QuickDraw GX 2.0, with reduced memory requirements, will be built into the upcoming Copland OS.

Finally, UniQorn 1.0, though relatively stable, crashes occasionally, particularly if you ask it to perform an impossible task. There are also a couple of irritating quirks. For instance, after deleting text, the screen doesn't update properly until you press the Command-tilde keyboard combination to force a screen refresh.

Conclusions

UniQorn's flexible presentation feature, typographical richness and trapping options make it a perfect complement to PageMaker and XPress. Version 1 is an innovative twist on the traditional DTP program, and this looks like it could be just the tip of Uniqorn's horn. SoftPress has said that the big focus in upcoming versions will be on repurposing — automatic conversion between different output formats, including paper, the Internet and CD-ROMs. If the company successfully refines the program and fixes the shortcomings of this initial release, it may do what other new document processors of recent years couldn't: make the "big two" of Mac DTP the "big three."

SoftPress Systems Ltd.'s U.S. office in Sausalito, Calif., is at (800) 853-6454; fax (415) 331-4824; support@softpress.com; http://www.softpress.com. □

LightningDraw GX 1.0 strikes right GX chord

By Bill Troop

With Version 1.0 of LightningDraw GX, the jokes about the world's two QuickDraw GX users can be retired. This $299 application from Lari Software Inc. — the first drawing program to take advantage of QuickDraw GX — has unique capabilities that could make everybody who uses illustration software want a copy.

Transparency — a key GX offering — is the product's most important feature.

For professional and entry-level users, LightningDraw's most important new feature is transparency, one of the key offerings of GX. Every object, including text and bit-map imports, can have any degree of transparency. LightningDraw's pull-down menus give you more than a dozen preset choices, including effects such as Tinted Glass, Reverse Translucent and Simple Transparency in 10 percent increments.

Although most users may never want to go beyond these choices, LightningDraw's flexible ink editor lets you cutomize and save a limitless number of personalized transparency and mixing effects. These are comparable to but easier to use than the most advanced features in Adobe Photoshop.

While both Adobe Illustrator and Macromedia FreeHand have primitive transparency simulation effects, they're so limited and inconvenient that it is hardly fair to compare them.

Channels

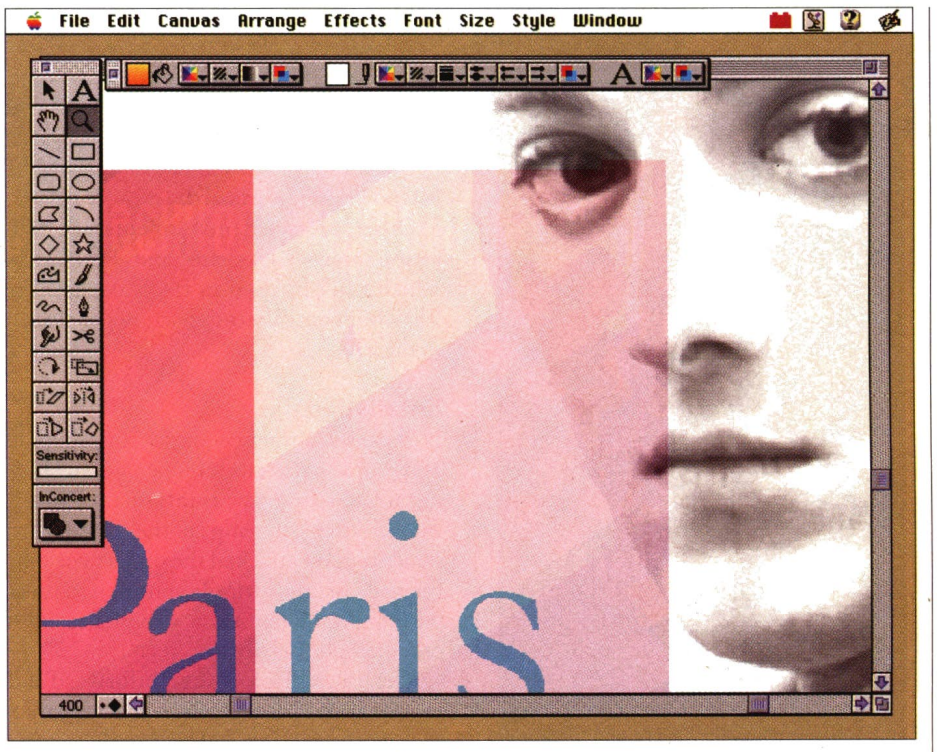
LightningDraw lets you import alpha-channel images from Photoshop. (The alpha channel is where Photoshop stores transparency information). The program can import a Photoshop image, scale it, change its transparency, add vector-based effects and text, and then send it back to Photoshop for further editing or convert it into an EPS file for separating in QuarkXPress — with all transparency effects intact.

Like FutureWave Software Inc.'s SmartSketch 1.0 (see 06.19.95, Page 44), LightningDraw "hides" Bezier control points and handles, which allows you to work more naturally: You can translate your ideas into pictures without having to think about how you're going to make your computer accomplish it.

For example, the Reshaper tool feels more like working with modeling clay than with Bezier curves. You simply apply the tool to any part of an object to reshape it; you don't have to look at control points and handles. The Reshaper can be used at different powers, via the sensitivity bar, to nudge, stretch and mold shapes. This tool is much more flexible than the path-editing tools in FreeHand and Illustrator.

Also unique is the InConcert pop-up, which lets every drawing tool add to or erase from the shape you're working on without having to worry about breaking and merging paths. This intuitive mode simplifies vector drawing considerably and shows why Lari had the confidence not to implement Add Point and Delete Point capabilities in this release: You add or delete shapes, not points.

Finally, LightningDraw offers typographical control and text effects, including perspective and 3-D distortion, with a twist: Text remains directly editable, no matter what you do to it. Unfortunately, you can't fit text to a path, although Lari says it is adding this capability to the next release, due in June. The program does offer sophisticated control of leading and justification. With GX fonts, it also lets you take advantage of GX's high-end optical alignment and hanging punctuation capabilities. Surprisingly, LightningDraw also makes it easier to deal with Adobe's multiple-master fonts than any other program. A simple slider in the text bar gives you continuous and instantaneous access to any multiple-master axis.



In Lari Software's LightningDraw GX Version 1.0, an imported Adobe Photoshop image, a standard PostScript typeface and a simple rectangle can each have a different transparency level.

For the rest, LightningDraw mostly duplicates and in some cases enhances the standard feature set of FreeHand and Illustrator. Veterans will have no problem learning the program because they'll find all the familiar tools, such as Brush, Pen, Freehand and Transformations, where they expect to find them. ColorSync 2.0 color matching is supported, along with eight different color models and 32-color gradients. The program works with all Mac fonts, and international users will appreciate its WorldScript capabilities.

The downside

As expected in a first release, LightningDraw doesn't yet have the depth of its mature competitors. It doesn't support Illustrator-compatible plug-ins, and it doesn't do autotracing. Gradients are limited to linear fills. Some precision functions are also weak: Rotation is controlled via mouse only, and a measurement tool is conspicuously absent. LightningDraw also lacks built-in color-separation features and needs more than one undo level. Lari promises that a number of these features will be added to the June maintenance release.

Another problem reportedly scheduled to be fixed soon is limited import and export capabilities. Right now, LightningDraw can import EPS, PICT and Photoshop 2.0 files and save in QuickDraw GX, GX-enhanced PICT, EPS, bit-mapped PICT, anti-aliased JPEG and Photoshop 2 format. (If you're working with Photoshop 3.0, you'll have to collapse the layers to save as a Photoshop 2 file.) Interestingly, the program's EPS exports to Illustrator and FreeHand keep all transparency attributes intact.

LightningDraw's limitations are alleviated by its capability to work with Photoshop better than any other vector-based program. The program has received some criticism for its inability to import TIFF images, but who needs to work with TIFF when LightningDraw lets you freely import and export Photoshop files with the alpha channel intact?

GX blues

LightningDraw requires System 7.5 or later and QuickDraw GX. Until Copland arrives, you'll need to install the QuickDraw GX extensions. QuickDraw GX 1.1.3, however, is relatively transparent and bug-free compared with earlier releases. Adobe PageMaker 6 is the only major publishing and graphics application that isn't happy with GX. The reason: You have to install a shareware work-around to get it to print.

Documentation consists of a single manual, balloon help and read-me files. Though not luxurious, the manual is a competent guide to this intuitive program. Technical support, which is excellent, is free except for the toll call.

Conclusions

While LightningDraw GX shows the signs of a 1.0 release, its strengths override its weaknesses. Its transparency and color-blending model lets everyone from professionals to novices use color the way we all see it — not the way computers, until now, have seen it. Once you start working with transparent colors, it seems so natural that other illustration programs seem crippled by comparison. And LightningDraw's intuitive drawing tools represent a fundamental rethinking of the way we interact with programs, and in the best Mac tradition, make drawing a more intuitive and graceful process.

Working with LightningDraw GX reminds us of the excitement of the first days of the Mac; there's revolutionary stuff happening here. Now we need Apple to work on making GX more acceptable to developers.

Lari Software Inc. of Chapel Hill, N.C., is at (919) 968-0701 or (800) 933-7303; fax (919) 968-0801; sales@larisoftware.com; http://www.larisoftware.com. □

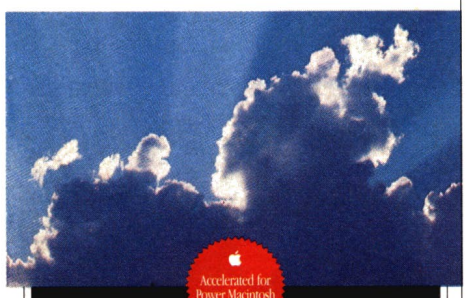
score card

LightningDraw GX 1.01

Lari Software Inc.
List price: $299
Overall value ◆◆◆◆

LightningDraw GX — the first drawing program to take advantage of QuickDraw GX — enters a software category ruled by two popular, mature programs: Adobe Illustrator and Macromedia FreeHand. Although this Lari Software program lacks the depth and finish of its esteemed rivals, graphic artists may find its transparency features indispensable for creating illustration effects no other program can match. Less demanding users will enjoy LightningDraw's intuitive drawing tools and the more natural way of looking at color that transparency allows. Although it does not yet work as well as we'd like with other vector-based programs, it more than makes up for this as an ideal companion program for Adobe Photoshop. We can finally see why GX makes sense. LightningDraw is the program Apple's new technology has been waiting for.

Performance ◆◆◆◆
Features ◆◆◆◆
Ease of use ◆◆◆◆◆
Documentation/support ◆◆◆◆



FOR

MACINTOSH USERS

WHO NEVER THROW

ANYTHING AWAY:

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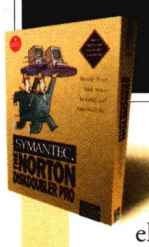

You're a pack rat of the highest order, looking for a little elbow room on your hard drive. Looks like it's Norton DiskDoubler Pro™ 1.1 to the rescue.

It compresses all files to at least half their size, seeking out uncompressed files and shrinking them in the background. It speeds up copying or deleting files. And DiskDoubler will help reduce online costs by letting you send compressed files that expand upon arrival.

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MW ★★★★ MacWorld 1995

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NUpowr

From Page 37

vested several thousand dollars in additional RAM can protect that investment and still upgrade to PowerBook 5300-level performance for less than $1,000 with the NUpowr upgrade board.

Other protected investments are 500-series internal modems and PC Cards, which can't be used in the 5300, and the 540's built-in Ethernet port, not included in the 5300.

Installation

Newer recommends dealer installation, and Apple demands it on penalty of voiding any remaining warranty on the PowerBook. After glancing at the written instructions, we attacked the project with the relaxed, assured attitude common to those with years of hands-on experience with other people's hardware.

The process looked straightforward and indeed it is, although the parts are small and the fit is tight. Removing the screws that hold the keyboard in place is easy enough, as is lifting out the keyboard to reveal the PowerBook's delicate internals. The instructions predict precisely where to exercise a bit of extra caution and when to press forward with more vigor than the inexperienced PowerBook owner might deem prudent.

The total job takes about an hour if you do it right, much longer if you're careless or simply have bad luck. We wasted two days tracking down a problem with the PowerBook 540c — not the NUpowr upgrade — that an authorized service facility probably would have diagnosed in minutes.

Don't do it yourself

Forking over an installation fee to an authorized service provider is probably worth it to avoid stumbling into a hardware thicket like we did.

On the other hand, a mere few days of downtime waiting for an upgrade installation might seem like express service to users in large organizations who suffer daily at the hands of capricious or turgid IS departments. Regardless, if you're inclined to do it yourself, you'll probably have better luck, particularly if you take your time and follow the clearly outlined instructions.

Once we switched to a fully functioning PowerBook, we had the NUpowr upgrade installed and performing flawlessly in minutes. If you should happen to get stuck, though, Newer will pay to ship your PowerBook overnight to its facility in Kansas.

Speed freak

MacWEEK Labs testing with MacBench 3.0 demonstrated that a PowerBook 540c equipped with the NUpowr board can hold its own in performance against a 5300c (see benchmarks above).

Newer is currently bundling the NUpowr board with Connectix Corp.'s Speed Doubler, and our Disk Mix results reveal that this was a wise decision. Living up to its name, Speed Doubler nearly doubled disk performance on a NUpowr 540c running System 7.5.2, which scored 6.3 without the Connectix utility and 11.6 with it.

Speed Doubler also boosted the speed of the PowerBook running System 7.5.3. Without Speed Doubler installed, the Disk Mix test with System 7.5.3 on the NUpowr 540c was 43 percent faster than System 7.5.2 on the same machine; with Speed Doubler it was 86 percent faster. Given that disk performance is the major performance bottleneck on PowerPC PowerBooks, the value of Connectix's faster emulator is clear.

> The NUpowr upgrade works as advertised, bringing 500-series PowerBooks up to 5300 performance levels.

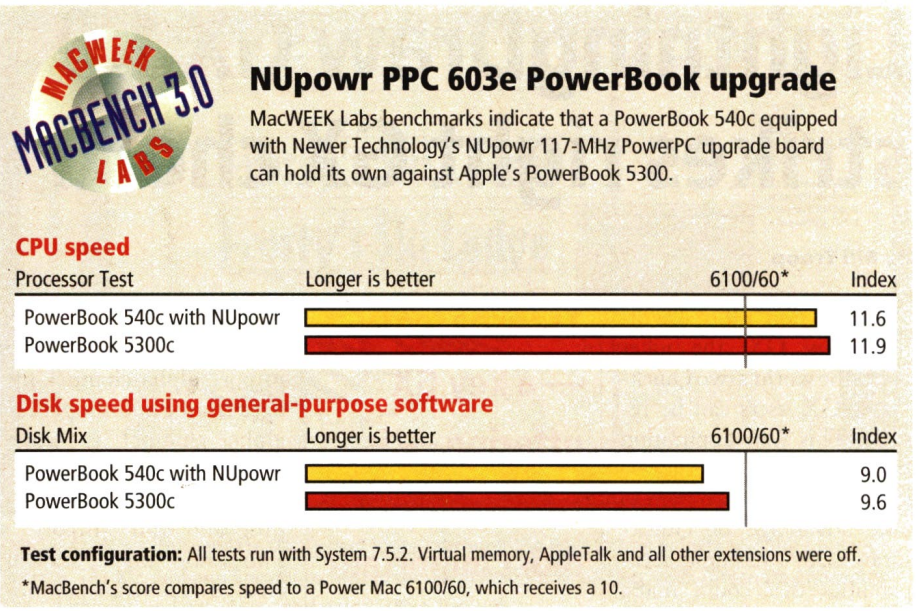
Characteristically, Apple at first denied Newer's request for a license to include the required system software. Now it has granted Newer that authorization, and the 7.5.2 upgrade CD-ROM is included with the board. System 7.5.3 became available at the end of our review period, and Newer said it expects to bundle that version within a few weeks.

Conclusions

Newer's NUpowr upgrade works as advertised, bringing 500-series PowerBooks up to 5300 performance levels and, with Speed Doubler, providing emulation superior to Apple's best efforts. It also protects your investment in 500-series RAM, internal modems and PC Cards.

Buying a new 5300 will, of course, get you some features that aren't available from a PowerBook 540c with an upgrade board. Chief among these is a 10.4-inch active-matrix color screen, which has much better color and can display 16 bits without compressing the display area to 640 by 400 pixels, an annoying 500-series feature. But if you need PowerPC performance and aren't ready to take the plunge for a new machine, the NUpowr's price is right.

Newer Technology Inc. of Wichita, Kan., can be reached at (316) 943-0222 or (800) 678-3726; fax (316) 943-4515; http://www.newertech.com. □


MACWEEK MACBENCH 3.0 LABS
NUpowr PPC 603e PowerBook upgrade
MacWEEK Labs benchmarks indicate that a PowerBook 540c equipped with Newer Technology's NUpowr 117-MHz PowerPC upgrade board can hold its own against Apple's PowerBook 5300.
CPU speed
Processor Test
Longer is better
6100/60*
Index
PowerBook 540c with NUpowr
11.6
PowerBook 5300c
11.9
Disk speed using general-purpose software
Disk Mix
Longer is better
6100/60*
Index
PowerBook 540c with NUpowr
9.0
PowerBook 5300c
9.6
Test configuration: All tests run with System 7.5.2. Virtual memory, AppleTalk and all other extensions were off.
*MacBench's score compares speed to a Power Mac 6100/60, which receives a 10.

score card

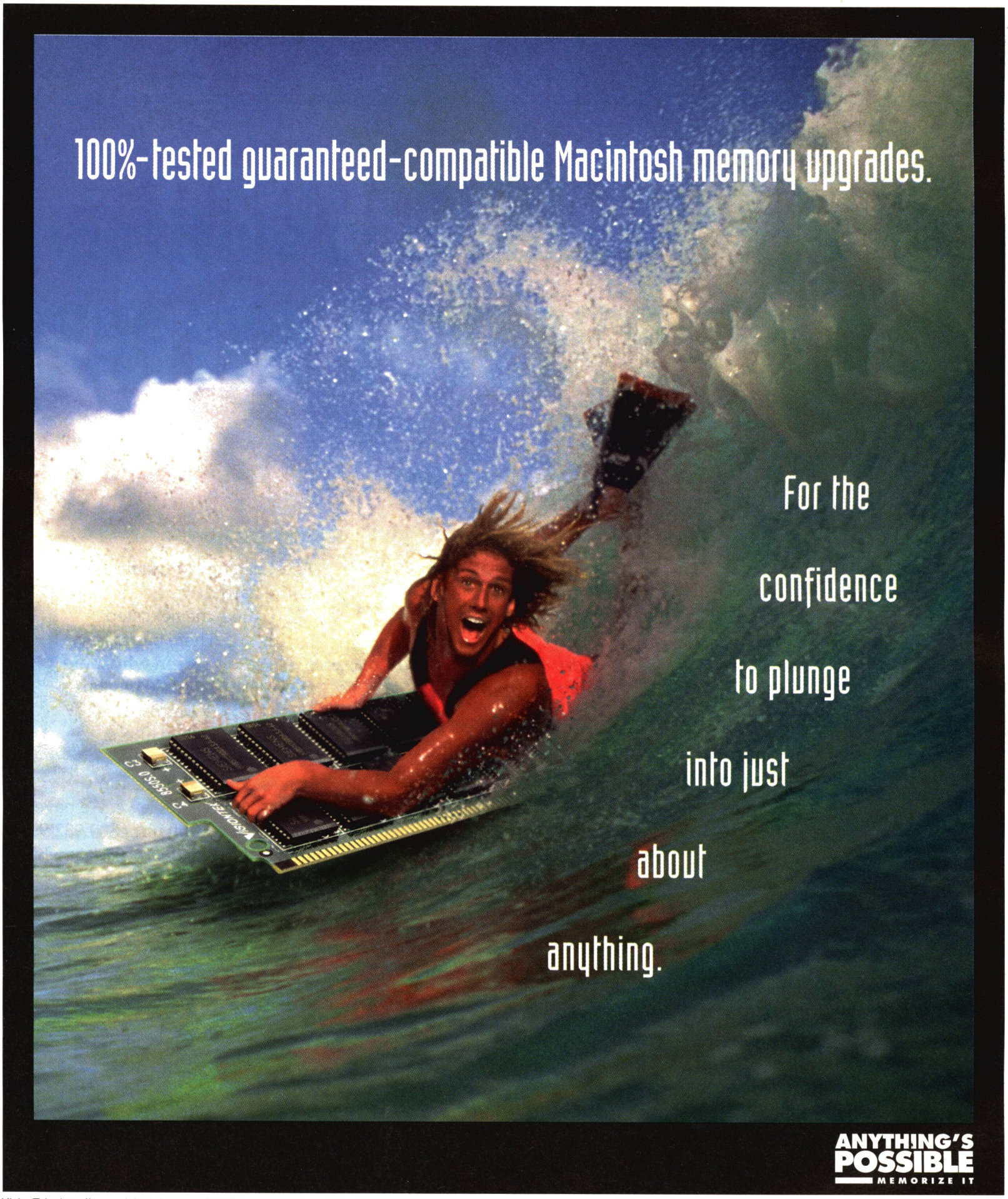
NUpowr

Newer Technology Inc.
Overall value ◆◆◆◆ **List price: $590***

Newer's NUpowr board for PowerBook 500-series machines puts a PowerPC 603 cranked to 117 MHz in your portable at a very attractive price. Installation is relatively simple, especially if you follow the documentation's advice to let an authorized technician do it. Once installed in our PowerBook 540c, the NUpowr board delivered performance comparable to the PowerBook 5300. Connectix Corp.'s Speed Doubler, included in a limited-time promotion, enabled the 540c to actually perform faster than the 5300 with System 7.5.3 in our MacBench 3.0 Disk Mix tests. Upgrading a 500-series PowerBook isn't the same as a buying a new 5300 — you miss out on the 5300's larger screen size, among other things — but for anyone stuck in the PowerBook's murky CISC past who can't afford a new machine, this is a very good solution.

Performance ◆◆◆◆	**Compatibility** ◆◆◆
Features ◆◆◆	**Documentation/support** ◆◆◆
Configuration ◆◆◆◆	

**For standard configuration without RAM; with 4 Mbytes RAM, $795; with 8 Mbytes RAM, $999.*



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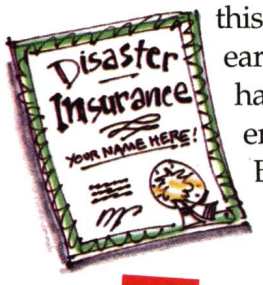

2. *Before you back up.*

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Retrospect will show you the best way. The EasyScript™ feature sets up a backup strategy from your answers to a few simple questions, then carries it out automatically to whatever media you select.

4. *How to back up if you're a big company.*

The answer is Retrospect Remote®, our network backup product. Use a set schedule or the more flexible Backup Server™ which automatically backs up Macs with the oldest backup first—ideal for PowerBooks that appear and disappear off the network. The bottom line: Retrospect Remote covers your network like a blanket.

5. *How to laugh in the face of danger.*

We're not suggesting standing on the top of the building during a lightning storm. But when disaster strikes, Retrospect can restore whatever you're missing—files from your latest backup, older files, or the entire hard drive.

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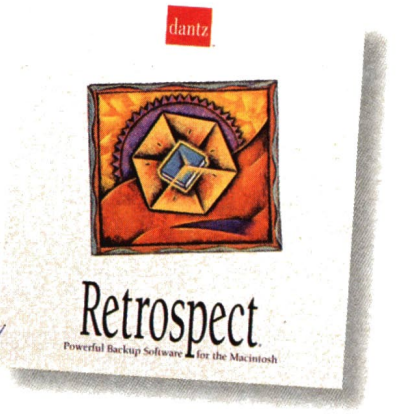

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UPGRADES

Competitive upgrades offer an edge over licensing costs

By Gene Koprowski

Sidegrading, or competitive upgrading, has become common among systems administrators who are trying to keep users' software up-to-date and keep an eye on the bottom line.

Rather than accept generous offers to upgrade all users to an unfamiliar product, some Macintosh systems administrators are using upgrade deals to test new software on a few machines, reducing the risks inherent in experimenting with new software.

"We've taken advantage of competitive upgrades in several ways," said Gary Cecil, IS manager for Stackig Public Relations and Advertising Inc. of McLean, Va.

Stackig, one of the largest ad agencies in the Washington, D.C., area, has 95 Macs, including Performas and Power Macs. Most of the users have Microsoft Word 5.1, but the new Macs that Stackig purchased recently came bundled with ClarisWorks.

"So many of the Macs are being bundled with [ClarisWorks], and this gives us software from which to upgrade," Cecil said. "We can do a sidegrade [to] a product that we already use in-house. That's how we obtain additional copies of Microsoft Word."

Stackig has used competitive upgrade deals for two Macs so far, "but we're going to be doing it more," Cecil said. "We all [have] Macs. And everyone except for our PR group uses Word."

There are 25 users in the PR group, and Cecil said he plans to use a sidegrade to get Word for that group. "It will save us a bundle of money — at least $200 per computer," he said. "It is a great deal."

"We identify software that we want and look for competitive upgrades that take the risk out of trying a product."

— Charles Pizzo, Edelman Public Relations

Cecil also reports similarly extraordinary savings — $300 per machine — when moving from Claris Corp.'s FileMaker Pro to Microsoft Corp.'s FoxPro.

Kick the tires

Testing is another way administrators use sidegrading to benefit their companies. Joel House, IS manager at Louis London Advertising Inc. of St. Louis, said software obtained through sidegrading is used for research and development at his ad agency.

"We, of course, take advantage of competitive upgrades wherever necessary," House said. "One of the key places we've used it has been if there is a new product on the market and we can't get a demo version of it. So we've gotten products through competitive upgrades at a much cheaper price for testing purposes."

House installs the software on one Mac and uses it for a few weeks to determine if it offers the features and benefits he is looking for.

Changing software is no simple task, and experimentation is always required. The company employs 110 people and has several Intel-standard PCs as well as 35 Power Macs. So when Novell Inc. announced it was selling the word processing unit of WordPerfect, House, whose company used WordPerfect, decided to test Microsoft Word 6.0.

"We want to have the best tools for our people," he said. "And WordPerfect was fine, but I hadn't seen a lot of development very recently on WordPerfect for Macintosh. What's more, we had heard a lot of horror stories about Word 6.0, and we like to bring new software in and test it before we roll [it] out and create a huge nightmare for [ourselves]."

The full price for Word 6.0 was $475 for a single-user license, but the competitive upgrade was only $279 for the same package.

House said he conducted similar in-house tests with Claris' FileMaker Pro 3.0 and is evaluating Microsoft Office for the Macintosh. Typically, installation of the software is limited to just a few computers,

See Solutions, next page

ILLUSTRATIONS BY DAVE EMBER

GORDON STUDER

MACINTOUCH

RIC FORD

Power Mac 5400 a dream with RAM, slot quirks

Ric Ford is moving this week and has taken a well-deserved respite from the duties of the column. Henry Norr and Rick LePage sifted through Ric's pile of tips and tricks to come up with this week's column. Look for Ric to return next week.

Although currently available only through Apple's education channels, the new all-in-one Power Macintosh 5400 is expected to eventually show up in the retail market, and it will probably be the foundation for other new low-end systems, with and without built-in displays, over the next year. While it looks almost identical to its 5200-series siblings, its logic board is a new one that preserves popular features from the current Performa family while borrowing technology from the business Power Mac line — and adding a few distinctive features and quirks of its own.

In place of the LC-compatible expansion slot built into most of Apple's low-end models over the past five years, the 5400 brings PCI to the masses, but only in short form: There's room for only 7-inch cards, so those that take up all 13 inches available in previous Power Macs won't fit.

Likewise, the new machine follows its higher-end predecessors in using the 168-

See MacInTouch, next page

SOLUTIONS

From previous page

he said, and the tactic is used exclusively with single-user applications.

Fear of flying

Some users, however, stay away from competitive upgrades altogether. Mike Gould, systems administrator for the College of Engineering at the University of Michigan in Ann Arbor, said there are discount programs available to educational institutions that make the lure of competitive upgrades less appealing.

Some users are just flat-out afraid to switch software. Tom Grier, director of the public information office at Winona State University in Winona, Minn., said that although the price of discounts is appealing, he won't go after a competitive upgrade.

"Since so much of our work is, and has been, in Word," Grier said, "I don't think we'd change software packages no matter how deep the discount.

"The conversion of archived documents would be a monumental task, and I shudder to think about even the minimal retraining of employees that might be necessary for a conversion to a new brand of software."

Ben Levy, owner of Solutions Consulting Inc. of Los Angeles, a Mac systems integrator who works with Hollywood studios and graphic artists, said the topic of competitive upgrading often leaves users feeling angry.

"The pricing on this stuff is very confusing," Levy said. "If [vendors] annoy customers enough, they are going to wander off."

Levy recalls purchasing WordPerfect 3.1 last year after Macworld Expo when his customers were complaining about Microsoft Word 6.0.

"That was the first time I had considered using WordPerfect," he said. "It has lots of good memory features, but the customer service was bad. And the price of it new is the same as an upgrade."

Levy got a copy and evaluated it, and instead of upgrading his customers, he left them using Microsoft Word 5.1 rather than 6.0.

No boundaries

The trend toward accepting competitive upgrade offers seems to be strong and simple. To participate, a user only has to photocopy the title page from a software manual or disks with identification numbers on them and send the copies to the company to receive the discounted upgrade.

> "Since so much of our work is in Word, I don't think we'd change software no matter how deep the discount."

"The most interesting thing about sidegrades is there doesn't seem to be a lot of accountability," Cecil said. "All you have to do is send them a copy of the title page from the manual; nothing prevents a dishonest person from sending duplicate copies of that page in. It seems too easy, and that's terrible to say."

Microsoft and other software vendors admit that controls are loose, but many users eventually do adopt software that they first experimented with as a competitive upgrade on a systemwide scale.

Charles Pizzo, principal of the New Orleans affiliate of Edelman Public Relations, said he was frustrated with the performance of Now Software Inc.'s DateBook Pro 4.0 personal information manager (which he purchased while it was owned by Adobe Systems Inc.) when Now Software offered him Now Contact at a great discount.

If Pizzo wanted to switch, all he needed to do was fax a copy of the first page of the software manual to Now Software, and he could purchase Now Contact 3.5 for $49.95. The retail price of Now Contact was $99.95.

At a small firm like Pizzo's, competitive upgrades can be helpful. He couldn't afford to switch to new PIM software without a test.

"We bought one on a competitive upgrade," Pizzo said, "and it was to shop the product. We identify software that we want, or software categories that we need, and we look for competitive upgrades that take the risk out of trying a product."

After his company tried Now Contact for about 60 days, Pizzo said, he and his staffers scrounged up original disks for competitive upgrades using some old versions of HyperCard that were lying around.

"We had tons of HyperCard disks, he said. "And we wound up getting Now Contact manager for the whole office. [The upgrade] allowed me to get into the software for $250 [per user], rather than $500. And when you're an entrepreneur, every nickel counts. That's a lot of money, and that was not the first time. We have done it in the past."

Upgrade backfire

Offering a competitive upgrade may not produce the desired effect that a vendor has in mind. The competitive upgrade tactic may result in the sale of just a few licenses at each new customer site.

Joel Salverberg is a technical consultant to Euregio Net AG, a Brussels, Belgium-based Internet service provider with 1,500 users. At the Mactivity '95 conference, CE Software Inc.'s QuickMail 3.5 was offered to him as an upgrade from SoftArc Inc.'s FirstClass BBS software. The pitch was to no avail.

"The sales representative was quite keen on having me convert from our system," he said. "They even rang me from the States to tell me that they would send a free 10-user evaluation package and that I could qualify for a discount of up to 50 percent," Salverberg said. "It sounded great. But I still prefer FirstClass."

Earlier, Salverberg was offered a great discount on a new Web server package for the Mac, but he is still using Quarterdeck Corp.'s WebStar, since it is the standard for Mac Web servers. Why? Because the product being offered by a European start-up company as a competitive upgrade was just Version 1.0. "I might try to get the discounted version later, when Version 2.0 comes out," Salverberg said. □

Solutions in the works

If you've had to link your Mac networks to mainframes in the past two years, we'd like to hear about your experiences, positive and negative.

- What were the best solutions?
- What didn't work at all?
- How did your users react to the change?

Send your comments to solutions@macweek.com. Please be sure to include information on how to contact you.

MACINTOUCH

From previous page

pin DIMM format for memory, but in this case there's only one socket (filled in shipping machines with an 8-Mbyte DIMM, complementing 8 Mbytes soldered to the logic board), and again there's a twist. Some DIMMs designed for other Power Macs won't work properly in the 5400. While the others accept DIMMs with what are commonly known as 2K or 4K refresh rates, the 5400's memory controller requires the 2K rate; technically, according to a recent Apple Tech Note, the system "does not provide support for 4 M by 4 bits (12 by 10 addressing) or 1 M by 16 bits (12 by 8 addressing) DRAM devices."

The note says Apple has notified leading memory vendors, but be sure to double-check if you are buying memory for the new system.

The 5400 accepts the same low-cost Apple video-in card and TV tuner as the Performa 630, 5200, 6200 and 6300, but Ethernet and modem cards developed for those systems' special Comm Slot won't work in the new model. The new model's equivalent, which Apple calls Comm Slot II, or CS II, is actually derived from PCI, not from what's now known as Comm Slot I. Apple is planning its own line of Ethernet adapters for the new slot; fortunately, it will also release technical specifications enabling other developers to produce products for the slot without resorting to reverse engineering — something it never did for the original Comm Slot.

Cool printer utility

We've been playing with Brookline Software's shareware utility PrinterSwitch for more than a month now, and it's one of those programs that makes you wonder why no one came up with it before.

> **PrinterSwitch is more elegant than Apple's desktop printing solution.**

PrinterSwitch displays a pop-up menu of printers when you call up the Page Setup or Print dialog boxes, allowing you to bypass the Chooser when you want to print that presentation in color or that large document to the high-volume printer down the hall. Every time you select a printer via the Chooser, PrinterSwitch adds it to the menu, remembering its name, zone and PostScript Printer Description file. The next time you want to switch to that printer, you won't need the Chooser at all.

You can configure PrinterSwitch to appear every time you call up either the Print or Page Setup dialogs, or only when you hold down a modifier key. (PrinterSwitch adds a dialog box of its own to the process, so the hot key comes in handy if you infrequently swap printers.) Brookline Software also supplies a Control Strip module with PrinterSwitch, which is helpful for those applications that bypass the standard LaserWriter dialogs, such as Adobe PageMaker.

PrinterSwitch doesn't work with QuickDraw GX, but it's a much more elegant solution to the multiple-printer situation than Apple's desktop printing extension. You can download a trial version of PrinterSwitch from Brookline Software at http://www.cs.brandeis.edu/~dan/home.html. Registration is $14.

Spiffing up FileMaker Pro

Claris Corp. has released an update to FileMaker Pro, Version 3.0v2. It adds some minor features and fixes bugs in a few calculation routines, repeating fields and cosmetic items. It's available free at http://www.claris.com/support/products/FileMaker/updater.html.

Our friend Rich Coulombre of The Support Group in Newton, Mass., passes along this undocumented tip: FileMaker 3.0 lets you apply colors and patterns to layout parts when you click on the part in Layout mode. If you wanted to do this in previous versions, you had to place a colored rectangle in the background of the part and resize it whenever the part grew or shrunk. □

Comments on MacInTouch are welcome at (508) 897-2621. Please address e-mail to ricford@macintouch.com on the Internet or 72511,44 on CompuServe. The MacInTouch home page is at http://www.macintouch.com/.

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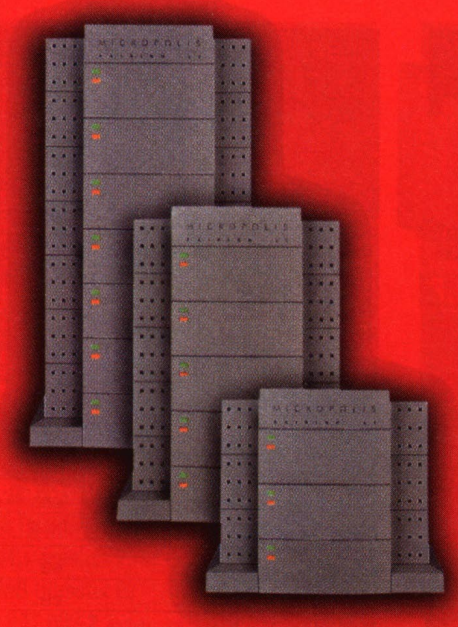

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850 MB	DT-850TB	Quantum	11 ms	2 yrs	$199	$275
1.05 GB	DT-51080	Seagate NEW LOW PRICE!	10.0 ms	5 yrs	$269	$344
1.0 GB	DT-1080FB	Quantum	11ms	3 yrs	$269	$344
1.05 GB	DT-31230	Seagate NEW LOW PRICE!	9.0 ms	5 yrs	$380	$455
2.0 GB	DT-4221	Micropolis NEW LOW PRICE!	8.0 ms	5 yrs	$545	$625
2.0 GB	DT-2490	Hewlett Packard	9.0 ms	5 yrs	$950	$1,050
2.1 GB	DT-32550	Seagate Barracuda II NEW LOW PRICE!	8.0 ms	5 yrs	$725	$800
4.3 GB	DT-3243	Micropolis NEW LOW PRICE!	8.5 ms	5 yrs	$999	$1,075
4.3 GB	DT-15230	Seagate Hawk 4 NEW PRODUCT!	9.0 ms	5 yrs	$899	$975
4.3 GB	DT-15150	Seagate Barracuda NEW LOW PRICE!	8.0 ms	5 yrs	$1,175	$1,250
9.0 GB	DT-1991	Micropolis NEW LOW PRICE!	12 ms	5 yrs	$1,950	$2,050
9.0 GB	DT-410800	Seagate Elite 9 NEW LOW PRICE!	11 ms	5 yrs	$2,025	$2,125

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2.0 GB	DT-4221AV	Micropolis NEW LOW PRICE!	8.5 ms	5 yrs	$600	$775
2.1 GB	DT-32550AV	Seagate Barracuda	8.0 ms	5 yrs	$725	$800
4.3 GB	DT-3243AV	Micropolis NEW LOW PRICE!	8.5 ms	5 yrs	$1,050	$1,125
4.3 GB	DT-15150AV	Seagate Barracuda	8.0 ms	5 yrs	$1,175	$1,250
9.0 GB	DT-1991AV	Micropolis NEW LOW PRICE!	12 ms	5 yrs	$2,050	$2,150
9.0 GB	DT-410800AV	Seagate Elite 9 NEW LOW PRICE!	11 ms	5 yrs	$2,025	$2,125

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Capacity	Model No.	Mechanism	Warranty	Internal	PHASER-I
2.1 GB	DT-32550W	Seagate Barracuda 2LP Wide	5 yrs	$799	$899
2.1 GB	DT-4221W	Micropolis 4221Wide	5 yrs	$625	$725
4.3 GB	DT-15150W	Seagate Barracuda 4 Wide	5 yrs	$1,225	$1,325
4.3 GB	DT-3243W	Micropolis 3243Wide	5 yrs	$1,050	$1,150
9.0 GB	DT-1991W	Micropolis 1991Wide	5 yrs	$2,085	$CALL
9.0 GB	DT-1991AVW	Micropolis 1991AVWide	5 yrs	$2,185	$CALL
9.0 GB	DT-410800W	Seagate Elite 9 Wide	5 yrs	$CALL	$CALL

DISK ARRAYS/RAID

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Capacity	Model No.	Mechanism	Seek	Warranty	EXTERNAL
4.0 GB	DT-32550W-2	Seagate - Fast/Wide Barracuda 2LP (2)	4.0 ms	5 yrs	$CALL
8.0 GB	DT-3243WAV	Micropolis - Fast/Wide 3243AV (2)	4.0 ms	5 yrs	$CALL
18.0 GB	DT-1991WAV	Micropolis - Fast/Wide 1991AV (2)	4.0 ms	5 yrs	$CALL

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ATTO Silicon Express IV	Nubus Fast/Wide Accelerator	$CALL
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SyQuest
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FAX ORDERS: (612) 942-0430

SYQUEST

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Capacity	Model No.	Internal	PHASER-I
88 MB	SQ5110C	$305	$365
200 MB	SQ5200	$420	$480
270 MB	SQ3270	$420	$470

CD ROM RECORDABLE

JVC Personal Archiver (2X)	$1,165
JVC Personal Archiver (4X)	$2,499
Yamaha CD Recorder (4X)	$1,699

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Capacity	Model No.	Format	PHASER-I
2 GB	HP-35470	4mm	$950
4-8 GB	Sony-5000	DDS-2	$999
4-8 GB	HP-1533A	DDS-2	$1,250
5-10 GB	Exabyte-8505	8mm	$2,150
15-30 GB	DLT-2000XT	DLT	$4,399

OPTICAL

INCLUDES ANUBIS FORMATTING SOFTWARE AND ONE CARTRIDGE

Capacity	Model No.	Seek	PHASER-I
230 mb	Fujitsu	30 ms	$675
1.3 GB	HP-C1716	23 ms	$1,999
1.3 GB	Maxoptix T-III	18 ms	$2,199

MEDIA

Type	Price
Syquest 44	$40
Syquest 88	$46
Syquest 105	$54
Syquest 200	$76
Syquest 270	$60
Optical 128 MB	$22
Optical 230 MB	$30
Optical 1.0 GB	$100
Optical 1.3 GB	$90

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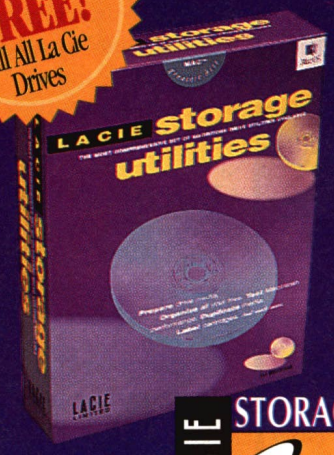

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- ▲ High-performance drive and controller technology.

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Quantum Atlas 4.3 GB

3.5" Drives		
850MB Quantum Trailblazer	3 yr. warr.	$189
1280MB Quantum Fireball	3 yr. warr.	$265
2160MB Ultrastar ES	5 yr. warr.	$469
4.3GB Quantum Atlas	5 yr. warr.	$888

Brackets available for $10 with internal hard drive purchase.

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- ▲ Up to 4.3GB capacity in a 6.5"x8.5"x2.2" compact case.

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Quantum 1280 MB

850MB Quantum Trailblazer	3 yr. warr.	$259
1280MB Quantum Fireball	3 yr. warr.	$335
2160MB Ultrastar ES	5 yr. warr.	$569
4.3GB Quantum Atlas	5 yr. warr.	$989

POWER WIDE HARD DRIVES

- ▲ Utilize Wide-SCSI technology for high-speed, high capacity file transfer

FAST: 1 drives + 1 card
WRITE 7.0 MB/Sec
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READ* 14.3 MB/Sec

FASTEST: 3 drives, 3 cards + RAID
WRITE* 32.8 MB/Sec
READ* 27.0 MB/Sec

Power Wide External Drives		
2.0GB Quantum Atlas Wide + Wide PCI Adaptec 2940 Board	NEW!	$1199
4.0GB Quantum Atlas Wide + Wide PCI Adaptec 2940 Board	NEW!	$1399
2.0GB Quantum Atlas Wide + RAID + Wide PCI Adaptec 2940 Board	NEW!	$1299
4.0GB Quantum Atlas Wide + RAID + Wide PCI Adaptec 2940 Board	NEW!	$1499

★ RAID Level 0 (Striped) For PCI Macs only

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- ▲ CD-Rs ship with Gear Multimedia software.
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CD-Recordables		
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- ▲ Available in two popular capacities.
- ▲ Compact storage convenience.

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2.6GB Optical

	Powerbook	Internal	External
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2.6GB External 1 yr. warr.			$1999
2.6GB Optical Cartridge			$99

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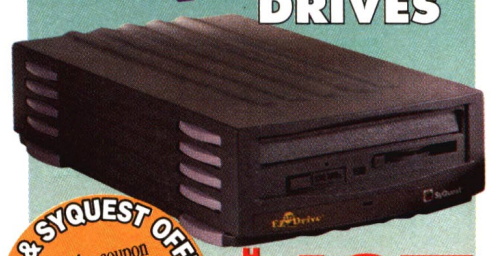

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EZ135MB Includes ONE FREE cartridge and coupon for 2nd FREE cartridge by mail!	2 yr. warr.	$187
270MB External		$279

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- ▲ The cheapest backup solution per megabyte.

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8.0GB DAT DDS-2

DAT Drives Includes Retrospect	
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8.0GB DAT DDS-2 External	$899
8.0GB TURBO DAT DDS-2 External	$1089

DLT DRIVES

Maximum Storage Capacity Ideal for network servers and high-end work stations

- ▲ Transfer rates from 150 to 180 MB per minute.
- ▲ Flexible cache buffer automatically adjusts to slower host data transfer rates.

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30.0GB DLT External

DLT Drives Includes Retrospect	
30.0GB Quantum DLT External	$2999
40.0GB Quantum DLT External	$4999

CARTRIDGES

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Syquest SQ400 44MB	$38 ea.	$37 ea.
Syquest SQ800 88MB	$42 ea.	$41 ea.
Syquest SQ2000 200MB	$66 ea.	$65 ea.
Syquest EZ135 135MB	$18 ea.	$17 ea.
Syquest SQ3270 270MB	$54 ea.	$53 ea.
Optical 128MB	$23 ea.	$22 ea.
Optical 230MB	$25 ea.	$24 ea.
Optical 1.3GB	$59 ea.	$58 ea.
Optical 2.6GB	$99 ea.	$97 ea.
CD-R 74 650MB		$8.99 ea.
DAT 90m	$9 ea.	$8 ea.
DAT 120m	$20 ea.	$19 ea.
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DLT 30 30GB	$40 ea.	$39 ea.
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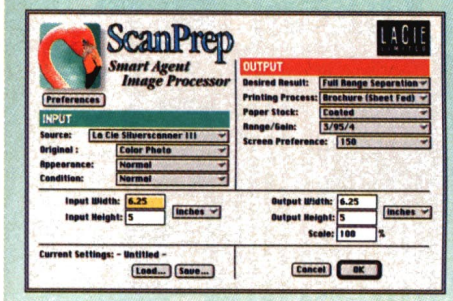
"ScanPrep is an essential application if you own a scanner... the sort of program that has to be seen to be believed."
Ben Long – MacWeek
Highest Possible Rating ◆◆◆◆◆

"No matter what acquired plug-in you get if you use Photoshop, you'll also want to buy a copy of ScanPrep."
– MacUser
Highest Possible Rating ★★★★★



ScanPrep automates Photoshop's image processing tools, individually preparing each image for printing right before your eyes. Simply describe the project to ScanPrep and scan the base image. ScanPrep yields professional prepress results, quickly and easily.

ScanPrep provides automatic adjustment of picture contrast and color saturation. Even when the original is lacking in contrast or saturation, it corrects the problem without human intervention.

Silverscanner PRO
24 bit color, 300 x 600 dpi interpolated to 1200 dpi.
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▲ ScanPrep
▲ Omnipage Lite OCR
$599

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Silverscanner PRO with Photoshop LE
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Silverscanner DTP
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1 Year Scanner Warranty

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▲ ScanPrep
▲ Omnipage Lite OCR
$1499

★★★★

Silverscanner III with Photoshop Full
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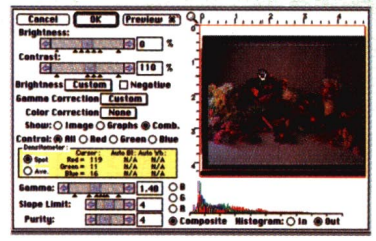
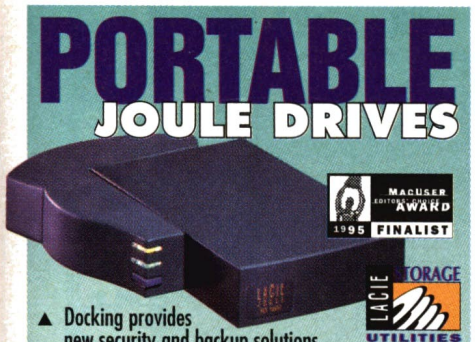
No matter which software bundle you choose, you'll also receive Silverscans' award-winning scanning software giving you professional scans.



PORTABLE JOULE DRIVES

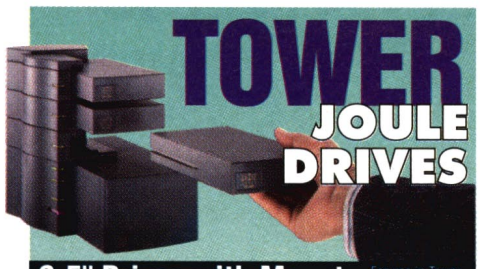


▲ Docking provides new security and backup solutions.
▲ Share hard disk-sized files with diskette convenience.
▲ Unplug and go for convenient data transport.

Joule 3.5" Drives with Dock

850MB Quantum Trailblazer	3 yr. warr.	$329
1080MB Quantum Fireball	3 yr. warr.	$369
2160MB Ultrastar ES	5 yr. warr.	$669
8.0GB DAT DDS-2	Includes Retrospect	$959
8.0GB TURBO DAT DDS-2	Inc. Retrospect	$1159
230MB Optical	1 yr. warr.	$499

TOWER JOULE DRIVES



3.5" Drives with Mount For use in Tower with a Joule Base.

850MB Quantum Trailblazer	3 yr. warr.	$329
1080MB Quantum Fireball	3 yr. warr.	$369
2160MB Ultrastar ES	5 yr. warr.	$669
4.3GB Quantum Atlas	5 yr. warr.	$1099
8.0GB DAT DDS-2	Includes Retrospect	$959
8.0GB TURBO DAT DDS-2	Inc Retrospect	$1159
230MB Optical	1 yr. warr.	$499

Joule Bases – Supports Stacks Up To 6 Drives High

850MB Quantum HD	3 yr. warr.	$389
1080MB Quantum HD	3 yr. warr.	$429
2160MB Ultrastar ES HD	3 yr. warr.	$699
230MB Optical	1 yr. warr.	$529

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85MB 3.5" Quantum Internal	$52	25
105MB Quantum Internal	$59	3
120MB 2.5" Quantum Internal	$69	3
365MB Quantum Int. (unformatted)	$99	75
540MB External	$199	50
720MB Quantum Int. (unformatted)	$149	3
1.05GB 3.5" HP Int. (unformatted)	$219	5
1.05GB HP External	$279	2
2.1GB Quantum Int. (unformatted)	$579	36
2.4GB Seagate Internal	$469	3
REMOVABLE DRIVES	**PRICE**	**QTY.**
128MB Panasonic Optical Int.	$139	7
44MB SyQuest Internal	$69	6
105MB SyQuest Internal	$99	5
155MB Teac Tape External	$99	2
600MB Teac Tape Internal	$59	14

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INTERNAL HARD DRIVE
$888
Quantum Atlas 4.3 GB

TSUNAMI HARD DRIVE
$335
Quantum 1280 MB

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Grayscale Pivot	$399
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PHOTOSHOP ACCELERATION

"If you frequently need to retouch large image files in Adobe Photoshop using such filters as Gaussian Blur, Sharpen, and Emboss, then you need either to have the patience of Mother Teresa or a digital signal processor (DSP) board." –Macworld

Radius PhotoEngine — from $399*
- Four AT&T 3210 66MHz DSPs
- Accelerates Photoshop Filters
- Up to 15x acceleration on all Macs
- MacUser Editor's Choice
- Available in Daughtercard or NUBUS versions

Standard video cards do not provide acceleration for many critical Photoshop functions, because they do not have on-board Digital Signal Processors (DSPs). When installed in your system, DSPs are used by Photoshop to process time consuming commands more than 10-times faster than built-in video.

Greatest Improvement Areas:
- Filters such as those in the Sharpen and Blur submenus
- Mode conversions such as RGB to CMYK color separations
- Image transformations such as rotations, effects, and resizes.

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SuperMac ThunderStorm DSP Boards	$299
Radius Color Engine for Thunder 30 Cards	$CALL
Radius PhotoEngine Nubus	$CALL
Adobe Photoshop 2.5 Deluxe CD Edition	$CALL
RasterOps Paintboard DSP Upgrades	$CALL
Radius GX (CMYK acceleration) Upgrades	from $349

Stop wasting valuable time: Imagine using filters that normally take twenty minutes to process finishing in only two to four minutes! How much additional time would you save in just one week? You can't afford to be without DSPs.

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- Full-bleed two page and one-page models
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- All consumables available

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Fargo Pictura 310 Color Printer	$CALL

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- Dual-function dye sub and wax thermal
- Editors Choice

QMS ColorScript 210/230 — $CALL
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QMS 860 Hammerhead 600-1200dpi — from $1999
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- Powerful RISC processor

Hewlett-Packard 4mv	$CALL
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QMS PS2210/2220	$1499/$1699

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- 22ppm • Dual-tray input

HOME/OFFICE

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- Full-Color output at crisp, laser-quality 360dpi Printer
- Heat Fusion process avoids Ink-jet smear
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* With purchase of any other item in ad

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QMS PS 825/825mr 600dpi	$799/$1099
QMS 1060 10ppm, 600dpi	$CALL
QMS PS 1500 15ppm	$1299
QMS PS 1700 17ppm, duplex optional	$1999
Apple OEM Laserwriter 8ppm	$499
Seikosha SP-2400AP dot matrix	$179
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GCC WriteMove/WriteMove II	$149/$249

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Mac IIcx 15" Color System — $275 CPU only
- Macintosh IIcx with 4MB RAM/80MB HD
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Add MacRecorder to Mac IIcx	only $99
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* with purchase of a PowerBook

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Daystar PowerPC and 040 Accelerators	$CALL
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-includes SCSI II Booster and RocketShare	
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Speed upgrades for all 680X0 and PPCs	$CALL

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Quadra 700 8/80/CD — $799*
- Powerful '040 processor
- Upgradable to Power PC
- NuBus expansion slots

Quadra 950 8/500, NEW — $1399
* with purchase of any qualifying monitor or video card

Quadra/Centris 610 8/80/CD — $699*
- Powerful '040 processor
- Multi-media ready with internal CD-ROM
- Built-in video supports up to 21" color monitors
- Software bundle with ClarisWorks, CD titles

Nubus Adapter for Quadra 610 — $99*

Macintosh Quadra 605/LC475 — $599 CPU only
- NEW CPU, with 4MB RAM and 250MB HD
- Powerful '040 processor
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- 24bit Full-Screen, Full-Motion Video
- Includes Adobe Premiere and VideoFusion
- Breakout bar supports dual input

* with purchase of Studio Array

Video Vision Studio Array — $1999
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- Includes FWB Jackhammer SCSI accelerator
- Chain up to three Arrays together (4GB,8GB,12GB)

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RasterOps 24MXTV	$CALL
RasterOps MoviePak II JPEG Daughtercard Upgrade	$CALL
Spigot II Tape Now Bundled with Adobe Premiere	$499
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VideoSpigot Cards Nubus/LC/IIsi	from $99*
Radius Spigot Power AV	$799

*With purchase of Adobe Premiere

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VIDEO CARD BUYING GUIDE - ALL HARD TO FIND CONFIGURATIONS ARE IN STOCK NOW!!

Video Card	Platform	Monitor (Colors) 14/15"	16/17"	19/20"	21"
Radius FPD Card	Mac Plus	Mono	–	–	–
Radius Pivot Card	SE/30	256	–	–	–
Xceed Color 30hr	SE/30	256	256	256	256
Lapis Color 16	SE/30	Thousands	Thousands	256	256
Lapis Color 24	SE/30	Millions	Millions	256	256
Radius Direct Color/gx	IIsi	Millions	–	–	–
SuperMac Spectrum 8	IIsi	256	256	256	256
SuperMac Spectrum 8.24	IIsi	Millions	256	256	256

Video Card	Platform	Monitor (Colors) 14/15"	16/17"	19/20"	21"
Radius FPD Card	Mac SE	Mono	–	–	–
SuperMac Superview	Mac SE	–	–	Mono	–
Radius TPD Interface	Mac SE	–	–	–	Mono
RasterOps 8/LC	LC/PDS	–	–	256	–
SuperMac Spectrum 8	LC/PDS	256	256	256	256
Lapis Color 16 for LC	LC/PDS	Thousands	Thousands	256	256
Micro Conversions 1724	LC/PDS	Millions	Millions	256	256
Lapis Color 24 for LC	LC/PDS	Millions	Millions	256	256

Video Card	Platform	Monitor (Colors) 14/15"	16/17"	19/20"	21"
Double Color SX	Nubus	256	256	16	–
RasterOps 708+	Nubus	256	–	256	–
RasterOps 24L	Nubus	Millions	–	–	–
RasterOps 8/LC	Nubus	–	–	256	–
SuperMac Spectrum 8	Nubus	256	256	256	–
Double Color LX	Nubus	256	256	256	256
Radius Direct Color 24	Nubus	–	–	–	Millions
E-machines Futura MX	Nubus	Millions	Millions	Millions	–

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- 900MHz digital cordless telephone
- Exceptional clarity
- Four programmable digital voice mailboxes

Reduced Price

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PageOffice

- Holds 10 pages in its document feeder
- Fax, E-mail, edit, file, or print scanned pages
- Uses a convenient SCSI interface
- Includes OCR software

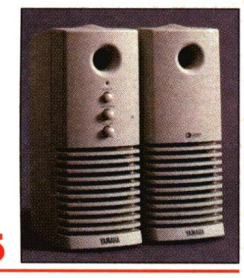
105304 **$289.95**

ComShare750

- Operate up to four devices on one phone line
- Save money by having equipment share lines
- Connect a telephone, fax machine, modem, and answering device

101418 **$119.95**

Yamaha Speakers



- Great sound from compact speakers
- Response range from 90 Hz to 20,000 Hz
- Includes master power, presence, and volume controls

101570 **$49.95**

Voice Organizer™

- Fits in the palm of your hand
- Stores up to 99 memos, 99 reminders, and 400 phone numbers
- Operates using simple voice commands

105372 **$149.95**

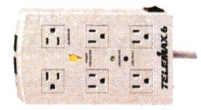
SCSI Sentry® II

- Solves tough termination issues
- Uses APS' patented DaTerm®, Digital Active Termination
- Includes a high-capacity, auto-switching international power supply
- Centronics 50 M/Centronics 50 F connectors

Reduced Price

1009-018 **$59.95**

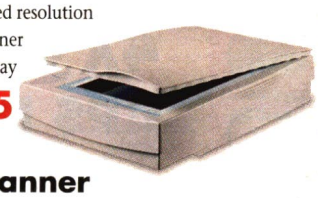
TELEMAX 6



- Protects six AC outlets and one fax/modem outlet
- Includes a $500,000 connected equipment warranty

100338 **$59.95**

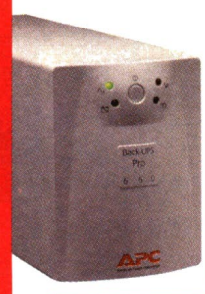
Relisys Taurus Scanner



- Up to 9600 x 9600 dpi interpolated resolution
- Single-pass cold scan flatbed scanner
- 30-bit color with 1024 levels of gray

105269 **$699.95**

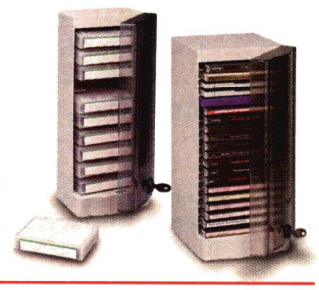
Back-UPS Pro



- Provides smooth, continuous power to your system
- Allows safe shutdown during power outages
- Microprocessor controlled voltage regulation
- Perfect for advanced workstations

ITEM DESCRIPTION	OUTPUT VA	CAP. WATTS	POWER TIME HALF LOAD	OUTLETS	PRICE
BACK-UPS PRO 280	280	175	20 MIN.	4	$159.95
BACK-UPS PRO 420	420	260	25 MIN.	4	229.95
BACK-UPS PRO 650	650	410	18 MIN.	4	299.95
BACK-UPS PRO 1000	1000	670	19 MIN.	6	399.95
BACK-UPS PRO 1400	1400	950	19 MIN.	6	499.95

4mm & CD Tower



- Tower design uses little space
- 4mm Tower holds up to 10 tapes
- CD Tower holds up to 20 CDs

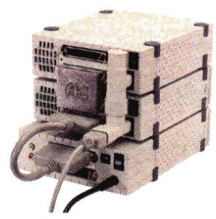
100951 4MM **$10.95**
100952 CD **14.95**

Relisys Scorpio Scanner

- 30-bit color at up to 2400 x 2400 dpi interpolated resolution
- Single-pass flatbed scanner
- Includes a 16-bit SCSI card, cable, terminator, and software

105268 **$429.95**

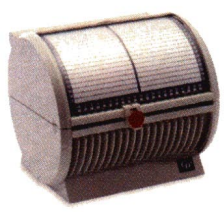
SCSI Conduit®



- Eliminates the nest of cables behind your drives
- Includes a 50-pin Centronics SCSI "C" connector, Power StacKIT, and stacking feet

105119 **$29.95**

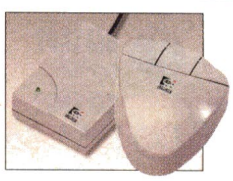
Compact Disc Storage System



- Safely stores up to 40 CDs
- Uses a third the space of jewel box storage

101186 BLACK
101187 WHITE
$29.95

Cordless MouseMan®



- Operates up to six feet away from its receiver
- Works even without a clear path to the receiver

106052 **$79.95**

Tropez 902 Platinum

- 900 MHz digital cordless telephone
- Two-line operation, three-way conference calling, and speakerphone

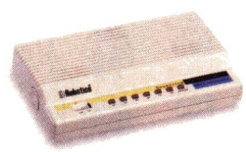
100408 **$299.95**

Small Media Vault

- Specially constructed for media protection
- Protects media against heat, moisture
- Holds more than 25 DAT tapes

101341 **$139.95**

USRobotics Sportster 28.8 Faxmodem



- Fully v.34 compatible at up to 33,600 bps
- Includes MacCom Center™ software
- 14,400 bps model also available

105292 28.8 FAXMODEM **$219.95**
101590 14.4 FAXMODEM **119.95**

HP DeskJet 340

- Compact and portable for easy printing anywhere
- Excellent high-quality printer value
- Holds up to 30 pages

105249 DESKJET 340 **$319.95**
105250 HP MAC ADAPTER **29.95**

Powershred Straight-Cut Shredder

- Shreds up to 20' per minute
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- Even cuts through staples

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100056	A.D.A.M the inside story	39.95
100154	Star Trek Tech. Manual	39.95
105332	Links Pro CD	39.95
105328	Body Works 5.0	41.95
105330	Compton's Interactive Encyclopedia	46.95

BEST SELLING CD-ROMS

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105334	Buried in Time	49.95
101627	Doom II	49.95
105331	Microsoft Encarta '96	49.95
100125	Myst	49.95

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101577	Alps GlidePoint	74.95
105301	Adesso Tru-Form Keyboard	84.95
105267	Adesso Mac Track Keyboard	99.95
105180	Kensington Thinking Mouse	99.95
105303	Kensington Turbo Mouse 5.0	104.95
106053	Logitech TrackMan® Live!™	139.95

BATTERIES/AUTO ADAPTERS

Item Number	Item Description	Price
106113	PB 140-180 Hi-Capacity Battery	$49.95
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100493	PB Duo 210/230 Battery	79.95
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106114	PB 5000 Series Battery – 190/5300	119.95
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- ✔ Terrific value
- ✔ Our highest capacity removable media device
- ✔ 4MB cache buffer improves drive performance
- ✔ Up to 2.4GB formatted capacity on a single, double-sided cartridge

Its terrific capacity makes the APS 2.6GB MO a great storage solution for large image files, network storage, and other demanding data storage applications. To improve data throughput and handling of large files, the drive uses a huge 4MB cache buffer which is further optimized by special caching algorithms. The drive is also read / write compatible with other ISO-standard 2.3GB and 1.3GB MO cartridges and is read compatible with 650MB cartridges.

JUST $1799.95 External configuration

650MB OPTICAL & 4X CD-ROM AT ONE LOW PRICE

APS PD4

- ✔ Combines removable optical storage and backup with CD-ROM in one device!
- ✔ Accepts 650MB rewritable optical cartridges and CD-ROMs interchangeably

$499.95 External configuration

Limited quantities, order now!

The new APS PD4 is the most versatile drive available for your Mac. Combining a fast 4X CD-ROM player with rewritable 650MB optical cartridge drive, the APS PD4 saves a SCSI address while performing these two important desktop functions.

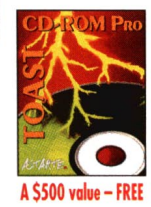
LOWEST PRICE EVER ON CD-R!

APS CD-R

- ✔ Uses CD media with 100-year shelf life
- ✔ Random access gives you fast retrieval
- ✔ TOAST CD-ROM Pro software – FREE
- ✔ 1-year warranty

$899.95 External configuration

At the lowest price ever for 2x CD-R technology, the APS CD-R is a fantastic value for authoring, mastering or backing up to CDs. CD-R media costs less than 2¢ per MB and has an estimated 100-year shelf life. The APS CD-R has a giant 1MB cache buffer and supports all popular CD formats specified in the Orange Book Part II. The APS CD-R comes with a FREE copy of the award-winning TOAST CD-ROM Pro recording software.



A $500 value – FREE

APS SYQUEST DRIVES

Model	Capacity/Feature	Awards	Internal	SR2000
APS SQ 3270	255MB Our best performing removable cartridge drive	MacUser LABS ★★★★½	N/A	$299.95*
APS SQ 5200	194MB Ultimate storage flexibility	MacUser LABS ★★★★½	N/A	389.95

While supplies last! CALL NOW! — *SQ 270 Cartridge $54.95*

APS CD-ROM DRIVES

Model	Features	Awards	Internal	SR2000
APS T 3701	6.7X-SPEED Sustained data transfer rates up to 1000KB per second!		$249.95	$299.95
APS PD4	CD-ROM/Removable Optical 650MB optical storage with 4X CD-ROM in one device		N/A	499.95*
APS CD-R	Recordable CD-ROM FREE TOAST CD-ROM Pro recording software ($500 value)	NEW LOW PRICE	N/A	899.95*
APS CD-R Pro	4X4 Performance CD-R FREE TOAST CD-ROM Pro recording software ($500 value)	NEW LOW PRICE	N/A	1799.95**
APS CD-R Mastering System	4X read/4X write recording engine and a 4GB AV scratch disk		N/A	2999.95†*

While supplies last! CALL NOW! — *†Also available with a 2GB hard disk*

APS MO DRIVES

Model	Capacity/Features	Awards	SR2000
APS 230MB MO	4500 rpm drive/230MB	MacUser LABS ★★★★	$449.95
APS 2.6GB MO	NEW FROM APS 4MB cache/2.6GB		1799.95

APS QIC & DAT TAPE BACKUP SYSTEMS

Model	Capacity/Features	Awards	Internal	SR2000
APS HyperQIC™	2GB QIC 3080 Mechanism	MacWeek ◆◆◆◆ MacUser LABS ★★★½	N/A	$499.95
APS DAT	2GB DDS-1 Non-Compression Mechanism		$649.95	699.95
APS HyperDAT®	8GB DDS-2 Compression Mechanism		849.95	899.95
APS HyperDAT® Pro	8GB DDS-2 High-Speed Mechanism		1049.95	1099.95

APS DLT TAPE BACKUP SYSTEMS

Model	Capacity/Features	Awards	Full-Height
APS DLT30	30GB Digital Linear Tape Mechanism	MacUser EDITORS' CHOICE AWARD 1995 FINALIST	$3499.95
APS DLT40	40GB Digital Linear Tape Mechanism		5499.95
APS DLT4500 Loader	200GB Digital Linear Tape Mechanism		9999.95

All APS tape drives include Retrospect® by Dantz®

APS HyperDAT®

- ✔ Up to 8GB of storage on one 120m DAT tape*
- ✔ High transfer rates of up to 28MB per minute*
- ✔ Compatible with all DDS-1 and DDS-2 media
- ✔ Includes the latest Retrospect 3.0 backup software – FREE

$899.95 External configuration

Delivering backup speeds as high as 28MB per minute, this DDS-2 backup system can pack up to an incredible 8GB on a single 120m DAT tape!* Perfect for office and network backup and archiving!

*With hardware compression
*Assumes 2:1 compression ratio

These products are performance-matched for optimal performance in the PowerPC environment.

APS MEDIA SALE

SyQuest — SALE PRICE

SQ-400 (44MB)	$39.95
SQ-800 (88MB)	44.95
SQ-327 (270MB)	54.95

3M — SALE PRICE

106148 2.6GB MO CART. $99.95

SALE PRICE

105299 74MB CD-R MEDIA $7.95

SALE PRICE

DLT III CARTRIDGE	$39.95
DLT IV CARTRIDGE	99.95

maxell — SALE PRICE

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90M DAT	9.95

SONY — SALE PRICE

106151 3-PK 128MB MO	$59.95
106152 3-PK 230MB MO	79.95

*Available only in full-height case

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APS Q 1080 JUST $229.95

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Internal configuration

- ✔ Well suited for home and office use
- ✔ Great for AV and non-AV applications
- ✔ 3.93MB/sec. sust. read, 4.27MB/sec. sust. write
- ✔ PRML technology delivers more storage to powerful CPUs & applications

For an incredible value in 1GB drives, look no further than the APS Q 1080. It is backed by a 3-year warranty and supports a 500,000 hour MTBF. If you're ready to take a step forward in drive capacity and performance, the APS Q 1080 makes that step an easy one to take.

4GB OF STORAGE FOR ONLY

APS Q 4.0 JUST $899.95

Internal configuration

- ✔ Embedded servo eliminates thermal recalibration
- ✔ 7200 rpm mechanism delivers high transfer rates
- ✔ 2MB cache buffer boosts performance
- ✔ 5-year warranty

Using an embedded servo as well as a high-performance 7200 rpm mechanism, the APS Q 4.0 is equally at home with AV and non-AV applications. It is based on the Quantum Atlas XP 34300 mechanism with a 4300MB formatted capacity. The drive employs a huge 2048KB cache buffer and a unique cache-management algorithm to push data transfer rates as high as 10MB per second.

7200 RPM PERFORMANCE, 5400 RPM PRICE

APS MS 2000 JUST $469.95

Internal configuration

- ✔ 7.31MB/sec. sust. write, 4.54MB/sec. sust. read
- ✔ 5400 rpm mechanism
- ✔ Performs like a 7200 rpm drive
- ✔ 5-year warranty

This incredible drive has the performance you'd expect from a 7200 rpm mechanism but with a 5400 rpm drive's price – and reliability! The APS MS 2000 formats to 2047MB, delivers sustained reads at up to 4.54MB/sec. and sustained writes at up to 7.31 MB/sec, has an average access time of 20ms and average seek of 9.6 ms. It has a 5-year warranty and is rated at 650,000 MTBF.

APS SCSI DRIVES

Model	Capacity/Features	Awards	Internal	SR2000
APS Q 840 Quantum 840 Trailblazer	**811MB** 4500 rpm		$189.95	NEW LOW PRICE $259.95
APS Q 1080* Quantum 1080 Fireball	**1042MB** 5400 rpm	MacWeek, LABS	229.95	NEW LOW PRICE 289.95
APS Q 1280 Quantum Fireball II 1280	**1222MB** 5400 rpm	LABS	269.95	369.95
APS I 2160 IBM Ultrastar ES	**2063MB** 5400 rpm		479.95	579.95
APS MS 2000 Micropolis 4421	**2047MB** 5400 rpm		469.95	NEW LOW PRICE 569.95
APS Q 2210* Quantum Capella	**2047MB** 5400 rpm	LABS	599.95	699.95
APS ST 4200 Seagate ST 15230N Hawk	**4094MB** 5400 rpm	LABS	889.95	NEW LOW PRICE 989.95

*While supplies last

APS IDE DRIVES FOR MACINTOSH

Model	Capacity/Features	Internal
APS Q 1280A Quantum Fireball II 1280	**1222MB** 5400 rpm (Fast ATA-2)	NEW LOW PRICE $229.95
APS ST 2140A Seagate Medalist ST32140A	**2167MB** 5400 rpm (Fast ATA-2)	349.95

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Then call 816-920-4150 from a fax machine with a handset or fax modem and follow the instructions.

APS HIGH-PERFORMANCE SCSI DRIVES

Model	Capacity/Features	Awards	Internal	SR2000
APS MS 2.0 Micropolis 4221	**1955MB** 7200 rpm	LABS	$549.95	$649.95
APS MS 2.0AV Micropolis 4221AV	**1955MB** 7200 rpm		649.95	749.95
APS Q 2.0 Quantum Atlas XP32150	**2050MB** 7200 rpm	LABS	699.95	799.95
APS ST 2.0 Seagate ST 32550N	**2047MB** 7200 rpm		749.95	849.95
APS MS 4.0 Micropolis 3243	**4064MB** 7200 rpm	LABS	899.95	999.95
APS Q 4.0 Quantum Atlas XP34300	**4101MB** 7200 rpm	LABS	899.95	NEW LOW PRICE 999.95
APS MS 4.0AV Micropolis 3243AV	**4064MB** 7200 rpm		999.95	1099.95
APS ST 4.0 Seagate ST 15150N	**4094MB** 7200 rpm	MacWeek, LABS	1199.95	1299.95
APS MS 9.0 Micropolis 1991	**8669MB** 5400 rpm		1899.95	2099.95*
APS MS9.0AV Micropolis 1991AV	**8669MB** 5400 rpm	LABS	1999.95	2199.95*
APS ST 9.0 Seagate ST410800N	**8669MB** 5400 rpm	NEW LOW PRICE	2099.95	2299.95*

- 30-day money-back guarantee on all APS brand products. Your risk is the cost of shipping.
- Drive-for-Drive Repair or Replacement Warranty. APS will, at its discretion, replace or repair products found to be defective according to the terms of the product's warranty.
- Refused orders subject to 20% restocking fee.
- Listed capacities are formatted.
- Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.
- Internal hard drives include brackets, cables, cords and LEDs required for operation with the specified Macintosh where applicable. External SCSI-2 drives come with a premium SCSI cable, power cord and user guide.
- All hard drives from APS Technologies come preformatted with Apple's System 7.0.1 software, and APS Technologies' APS PowerTools SCSI formatter/hard disk partitioner. You may need to install system software appropriate to your machine before use.
- Prices and specifications are subject to change without notice. Not responsible for typographical errors.
- Copyright © 1996 APS Technologies

APS FAST/WIDE SCSI DRIVES

Model	Capacity/Features	Awards	Internal	SR2000
APS MS 2.0W Micropolis 4221W	**1955MB** 7200 rpm		$649.95	$749.95
APS Q 2.0W Quantum Atlas XP32150W	**2050MB** 7200 rpm		799.95	899.95
APS MS 4.0W Micropolis 3243W	**4064MB** 7200 rpm		999.95	1099.95
APS Q 4.0W Quantum Atlas XP34300W	**4101MB** 7200 rpm		999.95	NEW LOW PRICE 1099.95

FAST/WIDE ADAPTER CARDS

Model	External SCSI Connection	Internal
QLogic Fast!SCSI Mac PCI-W Adapter for Fast/Wide drives	HD 68-Pin	$379.95
SiliconExpress IV For NuBus Quadras & Power Macs only. Fast/Wide adapter card.	HD 68-Pin	849.95

APS IDE POWERBOOK DRIVES

Model	Capacity/Features	Internal
APS Q 810 Quantum Europa	**778MB** 3800 rpm, Fast ATA-2	NEW LOW PRICE $339.95
APS Q 1.08 Quantum Europa	**1037MB** 3800 rpm, Fast ATA-2	NEW LOW PRICE 429.95

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MONITORS

radius
PrecisionView™ 21 Display

R016 1032

Quality, High Resolution Display for Creative Professionals
- 21" DiamondTron Color Tube w/aperture grill
- .30mm Dot Pitch
- Energy Star Compliant
- Capable of 1600 x 1200 resolution
- On Screen display of digital controls

R016 1032 **PrecisionView™ 21** $2299

R016 1031 **PressView 17SR** $1999

ViewSonic®
17GA PerfectSound Multimedia Monitor

V056 1016

FEATURES

BUILT-IN STEREO SPEAKERS

- HiFi Speakers built in
- 17" (15.7" Viewable Image Size)
- Max Res: 1280 x 1024
- PC and Mac compatible

V056 1016 **ViewSonic 17GA Monitor** $799

V056 1020 **ViewSonic PT770 Monitor** $899

SONY
Multiscan 17SFII

FEATURES
- 16.0" Viewable image size
- .25 mm Aperture Grille Pitch
- Max Mac Resolution: 1024 x 768 ™ 75hz
- On screen display of screen controls
- Macintosh Adapter included
- 3 Year Warranty parts and 2 Year CRT

S106 1018 **Sony Multiscan 17SFII** $915

S106 1017 **Sony Multiscan 15SFII** $515

NEC
14" C400 Monitor

NEW PRODUCT

N026 102

- 14" AntiStatic, Non-glare CRT
- .28mm dot pitch
- Max Resolution: 832x624

1 Year Manufacturer's Warranty

N026 1029 **14" C400 Monitor** $299
13.2" Viewable Image size

N026 1033 **15" C500 Monitor** $399
13.8 Viewable Image Size

N026 1031 **15" MultiSync XV15+** $469
13.8 Viewable Image Size

N026 1036 **NEC M500 15"** NEW PRODUCT $599
Chromaclear Monitor-13.8 Viewable Image Size

17" MultiSync XV17+

N026 1032

FEATURES
- 17" Flat Square Technology CRT
- 15.6" Viewable Image Size
- MAC Resolution up 1024 x 768 NI
- 0.28 mm dot pitch
- On-Screen Manager

N026 1032 **17" MultiSync XV17+** $799

N026 1007 **17" NEC XE17** $999

N026 1009 **17" NEC XP17** $1049

N026 1010 **21" MultiSync XE21** $1799
19.8 Viewable Image Size

VIDEO CARDS

radius
Thunder 30 PCI Cards

- 30-bit color with built-in photoshop Acceleration
- Real-time CMYK-to-RGB display
- On-the-fly resolution and bit-depth switching

R013 1070

R013 1070 **Thunder 30/1152** PCI Card $799
Resolution up to 1152 x 870

R013 1073 **ThunderColor 30/1600** PCI Card $1999
Resolution up to 1600 x 1200

XCLAIM GA

ATI's renowned *mach64* graphics acceleration chip gives the XCLAIM GA its exceptional abilities. It features 2MB or 4MB of VRAM,& displays up to 16.7 million accelerated colors at 1152x870 resolution.

A143 1010

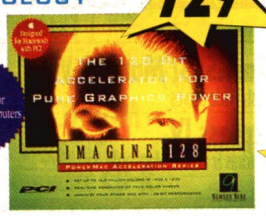
A143 1010 **ATI XCLAIM GA** 2MB PCI video card $369

A143 1009 **ATI XCLAIM GA** 4MB PCI video card $499

NUMBER NINE
VISUAL TECHNOLOGY

N080 1003

Imagine 128



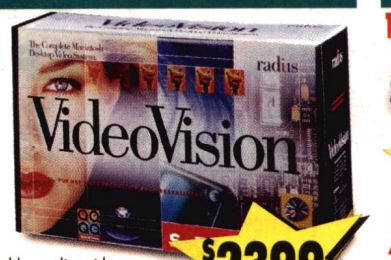
- 128-bit graphics engine
- 128-bit internal data path
- 128-bit memory bus
- Exclusive WideBus™ design means drawing pathways are a full 128-bits wide from processor to high speed VRAM

N080 1002 **Imagine 128** 8MB Accelerator $1169

N080 1003 **Imagine 128** 4MB Accelerator $729

DIGITAL VIDEO

radius
VideoVision Studio 2.5.1



Broadcast-Quality Video
VideoVision studio can deliver broadcastable quality video output in NTSC and PAL timing.

16-bit Audio
VideoVision Studio can now simultaneously capture video with 16-bit, 44.1 KHz stereo sound using the on-board audio of the Power Macintosh.

R013 1018 **VideoVision Studio 2.5.1** $2399

Radius Telecast Upgrade

Telecast combines component video, professional audio with an open architecture to give video professionals hardware and software choices. Telecast reinvents the entire post production process providing options for producing quality programming in a variety of formats.

R013 1077 **Telecast Upgrade** $3459

TRUEVISION
Targa 1000 Digital Video Editing

T043 1003

Transform Your Desktop Computer into a Powerful Digital Video Editing System.
...Easily and Affordably!

T043 1003 **Targa 1000** (PCI Power Macintosh) $2699

T043 1001 **Targa 2000** (PCI Power Macintosh) $2995*
(* as low as $2995 w/qualified trade-in)

MEMORY

SPECIAL

16MB 4x32 SIMM

M101 1054 **8MB 72 Pin Simm** $155

M101 1072 **16MB 72 Pin Simm** $299

M101 1081 **8MB Dimm** $155

M101 1082 **16MB Dimm** $299

ALL MEMORY AVAILABLE! CALL FOR BEST PRICE.

ACCELERATORS

DAYSTAR DIGITAL

3 Year Warranty — JODY Lifetime Warranty

Mac IIci, IIsi, IIvx, Performa 600

Runs your current software up to twice as fast, and runs PowerPC applications 7 to 11 times faster.

66MHz Turbo 601

D040 1039

100MHz PowerPro 601

D040 1043

Quadra and Centris (610, 650, 700, 800, 900, and 950 series)
- Transforms your Mac into a top of the line PowerPC workstation
- Works with your current memory
- 64-bit data path increases performance
- Requires System 7.5

D040 1018 **40/Mhz Turbo 040** with 128K cache $599

D040 1043 **100Mhz PowerPro 601** with 1MB cache $1199

D040 1048 **100Mhz Turbo 601** $1139

MicroMac Technology
Carrera040

NEW PRODUCT

MAC IIci, IIisi, IIcx, or IIx
Just plug in the Carrera040 accelerator and instantly get blazing performance from your existing Mac

M264 1003 **40/80Mhz Carrera 040** with FPU $599

PRINTERS

EPSON
2 WARRANTY

Stylus Color Pro

E047 1019

FEATURES
- 720 x 720 dpi photo quality on plain paper
- PostScript upgradable
- True black laser text
- Pantone matching
- Text print speed up to 3ppm, color 1ppm

E047 1019 **Epson Stylus Color Pro** $499

E047 1018 **Epson Stylus Color II** $299

Epson Stylus Color Pro XL

FEATURES
- Prints up to 12.5" x 18" full bleed in Photoquality color
- 720 x 720 dpi photo quality with Microdot technology
- Optional Adobe PostScript with Pantone Color Calibration

E047 1022

E047 1022 **Epson Stylus Color Pro XL** $1799

E040 1070 **Adobe PostScript Level 2** $265
Software Upgrade for Stylus Pro XL

HEWLETT PACKARD
1 Year Manufacturer's Warranty

HP LaserJet 5MP

FEATURES
- 600 x 600 dpi laser printing with HP Resolution Enhancement technology
- 120 levels of grey
- 6 ppm print speed
- 3MB RAM standard, expandable up to 35 MB w/Adobe Memory booster
- Adobe PostScript level 2 with 35 scale typefaces

H047 1030 **HP LaserJet 5MP Printer** $1045

HP DeskJet 855Cxi Printer

FEATURES
- ***COLOR PRINTER***
- Dual I/O for PC or Macintosh connection
- Black print speed up to 7ppm
- Color print speed up to 3ppm
- Handles plain and special papers, transparency film, and envelopes

H047 1065 **HP DeskJet 855Cxi InkJet Printer** $499

SCANNERS

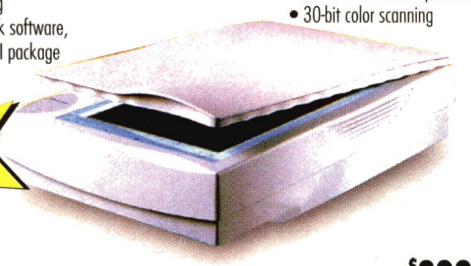
RELISYS SCORPIO

- 300 x 1200 dpi
- 2400 x 2400 interpolated
- 30-bit color scanning

Both include : E-Disk software, OmniPage LE and SCSI package

TAURUS
- 600 x 1200 dpi
- 9600 x 9600 interpolated
- 30-bit color scanning

$399



R060 1016

R060 1016 **Relisys Scorpio Color Scanner** $399

R060 1017 **Relisys Taurus Color Scanner** $699

Reli 4830 Mac/TE Color Scanner

Special Blowout Price While Supplies Last!

$899 R060 1004

BEST BUY

30 Bit Transparency Adapter Included!

R060 1004 **Reli4830 MAC/TE Color Scanner** $899

UMAX® Powerlook II

The Magic of Color™

$2495

NEW LOW PRICE

FEATURES
- 36-bit color scanning
- 600 x 1200 dpi
- 3.3 Dynamic Range
- Includes Transparency Adapter
- Package includes:
  - Adobe Photoshop
  - KAI's PowerTools SE
  - PowerPhotos CD
  - WordLinx OCR
  - Pixar Typestry
  - Pixar 128CD

30 DAY MONEY BACK GUARANTEE

1 Year Manufacturer's Warranty

U010 1052 **PowerLook II** 36-bit color scanning, 600 x 1200 dpi $2495

Umax Vista-S12 LE

FEATURES
- 600 dpi & 33-bit equivalent analog gamma correction
- Package includes Adobe Photoshop LE 3.0, WordLinx OCR, Corel Professional Photos CD

$799

1 Year Manufacturer's Warranty

30 DAY MONEY BACK GUARANTEE

U010 1055 **Vista-S12 LE** $799

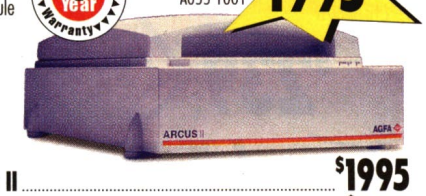
AGFA Arcus II

FEATURES
- 600 dpi & 36-bit color scanning
- 3.0 Dynamic Range
- Includes Transparency Module
- Package includes:
  - Adobe Photoshop
  - Agfa FotoLook Scanner driver software
  - Agfa FotoTune Color Management software

1 Year Manufacturer's Warranty

A055 1001

$1995



A055 1001 **AGFA Arcus II** $1995

A055 1011 **AGFA StudioScan IIsi** $699

MICROTEK ScanMaker III

Better Images Through Innovation.

FEATURES
- 600 dpi & 36-bit color scanning
- Includes Transparency Adapter
- Single pass scanning
- DCR (Dynamic Color Rendition) calibration/correction system
- Apple ColorSync compatible
- Package includes Adobe Photoshop

1 Year Manufacturer's Warranty

$1989

M150 1006 **Microtek ScanMaker III** $1989

INPUT DEVICES

WACOM Art Z II 6" x 8" ArtPad

$298

Don't buy a tablet that uses batteries...get a WACOM

W010 1028 **ArtZ II 6x8** $298

VISIONEER PaperPort Vx

FEATURES
- 6 second typical scan time
- 400 dpi resolution
- 256 Gray-scale imaging
- Scan Documents up to 30" long
- Includes OmniPage Lite, CardScan SE, PictureWorks Copier

MACWORLD MW

$279

30 DAY MONEY BACK GUARANTEE

V029 1008 **PaperPort Vx for Macintosh** $279

EPSON ES1200C Pro

FEATURES
- 600 dpi optical resolution, and up to 4800 dpi (via interpolation)
- 30-bit color scanning
- Pro Package includes:
  - Adobe Photoshop
  - Scantastic
  - KAI's PowerTools
  - SCSI cable

$1179

E045 1003

2 YEAR WARRANTY

E045 1003 **Epson ES1200C Pro-MAC Color Scanner** Full Package $1179

E045 1007 **Epson ES1200C LE-MAC Color Scanner** w/Scantastic $949

E045 1013 **Epson ES1000C LE-MAC Color Scanner** $735

Nikon ELECTRONIC IMAGING COOLSCAN II

Introducing the Newest Addition to the Coolscan Family!

- Single-pass, 2700 dpi, 24-bit, 35mm Desktop Film Scanner
- 20 second pre-scan, 80-second final scan for 2592 x 3888 pixels
- Cool LED illumination for long life and low noise
- Intelligent hardware autocalibration, autofocus, autoexposure and autocolor balance
- Nikon Scan driver software ensures ease of use
- Adobe Photoshop plug-in
- SCSI-2 interface

$1199

NEW PRODUCT

1 Year Manufacturer's Warranty

N045 1008 **Coolscan II** $1199

MODEMS

GLOBAL VILLAGE COMMUNICATION TelePort Platinum Fax/Modem

$199 G050 1016

5 Year Manufacturer's Warranty

G050 1016 **TelePort Platinum** 28.8 data, 14.4 S/R, GlobalFax, GlobalFax OCR $199

G050 1019 **PowerPort Platinum Pro** $499
Combo 10base-T Ethernet, 28.8 data, 14.4 S/R, Fax, Type II PC Card

BEST DATA Smart One 2834FLXMAC Data/Fax Modem

Merging Multmedia & Communications

Count on Best Data Modems for speed and affordability.

B020 1001

$154

5 Year Manufacturer's Warranty

B020 1001 **Best Data 2834FLXMAC** 28,8 v.34 External Fax/Modem $154

B020 1003 **Best Data 2834VLXMAC** 28,8 v.34 Ext. Fax/Modem w/Voicemail $188

US Robotics 28.8 Sportster

The Intelligent Choice in Data Communications

$195

U020 1021

FEATURES
- 28.8 V.34 and 33.6 kbps
- V.32 bis at 14.4 kbps
- V.42/mnp 2-4 error control
- Macverter Fax and Data Software
- CD-ROM of Internet Access Software
- Discover the World Wide Web with your Sportster Guidebook

5 Year Manufacturer's Warranty

U020 1021 **US Robotics 28.8 Sportster for Mac** $195

U020 1025 **US Robotics Sportster voice 28.8 w/voice** $259

Supra 28.8 Ext V.34

Supra Corporation

$218

FIVE YEAR Warranty SUPRA QUALITY GUARANTEE

FEATURES
- V.34 and Flash ROM technology
- Includes caller ID, Silent Answer Fax and Voice Line Sharing
- FAXcilitate fax software, MicroPhone LT data software and CompuServe Information Manager software
- 28.8 kbps data speed with maximum throughput of 115, 200 bps, 144.4 send/receive fax
- V.42bis data compression MNP 2- & 10 error correction

S140 1007 **Fast Mac V.34 28.8 bps Fax/Data Modem** $218

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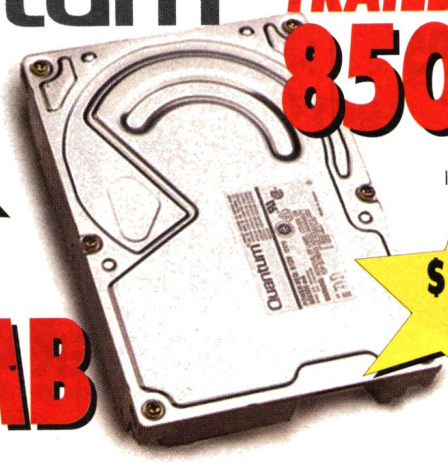
CLUBMAC HARD DRIVES

Quantum

Internal Fireball C104 0001 — $239



TRAILBLAZER 850MB

14ms Access Time
Internal TrailBlazer C104 0002 — $189

FIREBALL 1280MB

12ms Access Time — $269

Backed by ClubMac's 30 DAY Money Back Guarantee

Capacity	Model	Part No.	Internal	Part No.	External
850MB	Trailblazer 14ms	C104 0002	$189	C104 0052	$249
1080MB	Fireball 12ms	C104 0000	$239	C104 0050	$299
1280MB	Fireball 12ms	C104 0001	$269	C104 0051	$329

BEST BUY — $939

ATLAS 4.3GB 7200 RPM 1024K CACHE

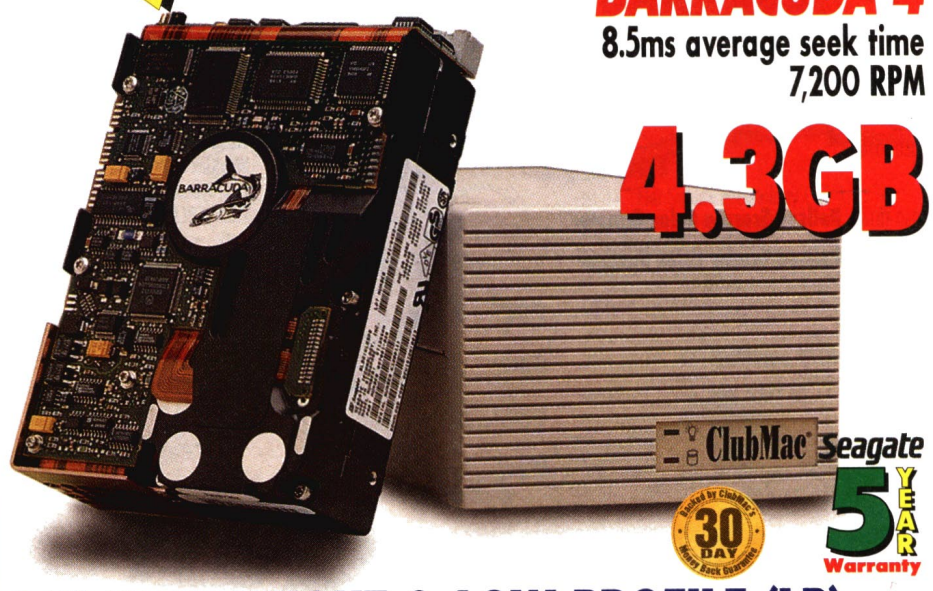
Internal Atlas C104 0005

Backed by ClubMac's 30 DAY Money Back Guarantee

Capacity	Model	Part No.	Internal	Part No.	External
2200MB	Capella 8.5ms	C104 0003	$599	C104 0053	$659
2150MB	Atlas 8ms	C104 0004	$689	C104 0054	$749
4280MB	Atlas 8ms	C104 0005	$939	C104 0055	$999

Seagate

C104 0301 — $1159



BARRACUDA 4 4.3GB

8.5ms average seek time
7,200 RPM

5 YEAR Warranty

Backed by ClubMac's 30 DAY Money Back Guarantee

3.5" HALF HEIGHT & LOW PROFILE (LP)

Formatted Capacity	Model	Part No.	Internal	Part No.	External
1.0GB	Medalist 51080N	C104 0302	$269	C104 0352	$329
2.1GB	Hawk 2 32430N	C104 0303	$689	C104 0353	$749
2.5GB	Barracuda 2LP 32550N	C104 0300	$729	C104 0350	$789
4.3GB	Barracuda 4 15150N	C104 0301	$1159	C104 0351	$1219

5.25" FULL HEIGHT

9.1GB	Elite-9 410800N	C104 0305	$1999	C104 0355	$2099

CLUBMAC FAST AND WIDE DRIVES

Quantum

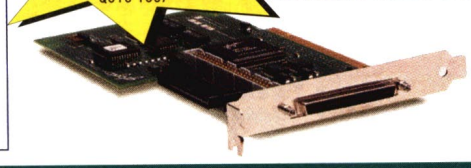
2200MB	Capella VP32210SW	C104 0100	$699	C104 0150	$799
4280MB	Atlas XP34300 SW	C104 0102	$1029	C104 0152	$1129

Seagate

2.1GB	Barracuda 2LP ST32150W	C104 0400	$799	C104 0450	$899
4.3GB	Barracuda 4 ST15150W	C104 0401	$1229	C104 0451	$1329
9.1GB	ELITE 9 ST410800W	C104 0402	$2099	C104 0452	$2219

qlogic Corp.

$229 Q010 1007



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Accelerate all internal and external storage devices on your computer! Hard drives, optical, tape, SyQuest, etc. Supports SCSI-1, SCSI-2, Fast SCSI-2, and Fast & Wide SCSI-2. SCSI manager 4.3 features built-in. Flash ROM upgradeable via software. Use to create the fastest arrays for Power Macintosh and Macintosh. Supports System 7.5 4GB volume size. Requires a full size NuBus slot or a PCI slot.

$389

MACUSER EDITORS' CHOICE AWARD 1993 WINNER

F094 1033	SCSI JackHammer PCI	$389
F094 1002	SCSI JackHammer NuBus	$459

CLUBMAC CD-ROM DRIVES

$169 C104 1700

ClubMac® 4.4X

Features:
600KB/sec data transfer
190ms avg access time
Caddy-less design

C104 1700	ClubMac 4.4X-Speed CD-ROM Drive	$169

ClubMac®

		Access time	Trans Rate	
C104 1600	ClubMac Six-Speed CD-ROM Drive	140ms	900k/sec	$299
C104 1700	ClubMac 4.4X-Speed CD-ROM Drive	140ms	600k/sec	$169
C104 1400	ClubMac Classic 2X CD-ROM Drive	250ms	300k/sec	$79

NEC

		Access time	Trans Rate	
N024 1062	MultiSpin 6Xe CD-ROM Reader	150ms	900k/sec	$479
N024 1070	MultiSpin 4Xc 7 Disc Changer	350ms	600k/sec	$339
N024 1011	MultiSpin 3Xp plus Portable CD-ROM	240ms	500k/sec	$349

NEC

$339 N024 1070

MultiSpin 4Xc 7 Disc Changer

Load 7 Discs at a time!

N024 1070	NEC MultiSpin 4Xc 7 Disc Changer	$339

CLUBMAC REMOVABLE STORAGE

ClubMac 200 MB SyQuest® Drive

Mac OS COMPATIBLE

$299* C104 1801

C104 1801 **ClubMac 200MB 5.25" Removable** **$299***

*With purchase of 200MB cartridge.

NEW LOW PRICES ON GENUINE SyQuest Cartridges

FEATURING SyQuest® REMOVABLE TECHNOLOGY

SyQuest 5 YEAR Warranty

SyQuest Media

Part Number	Media	Qty 1	Qty 10	Qty 20
S198 1010	44MB	$40ea	$39.50ea	$39ea
S198 1011	88MB	$44ea	$43.50ea	$43ea
S198 1012	200MB	$69ea	$68ea	$67ea
S198 1013	105MB	$35ea	$34.50ea	$34ea
S198 1014	270MB	$57ea	$56ea	$55ea
S198 2010	EZ135MB	$19ea	$18.50ea	$18ea

Mac OS COMPATIBLE

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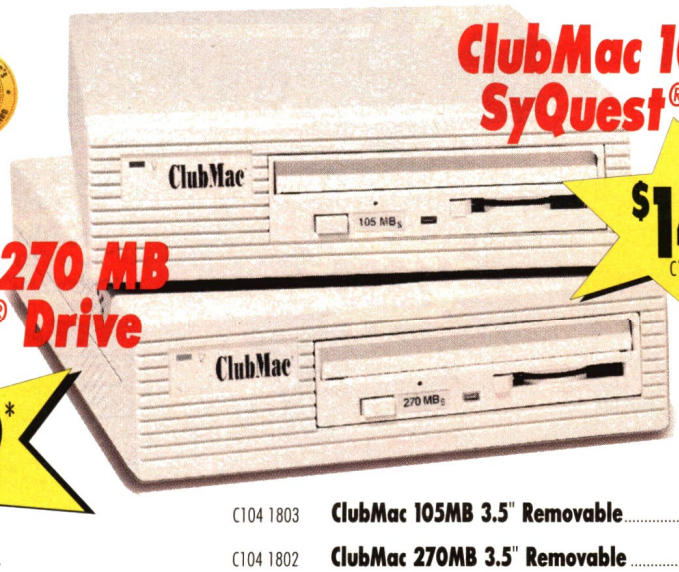
ClubMac 105 MB SyQuest® Drive



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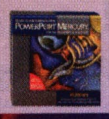

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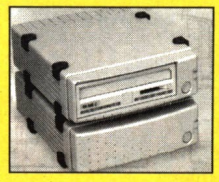

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PowerMac Memory Selection Guide

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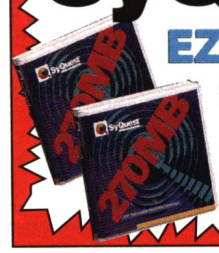

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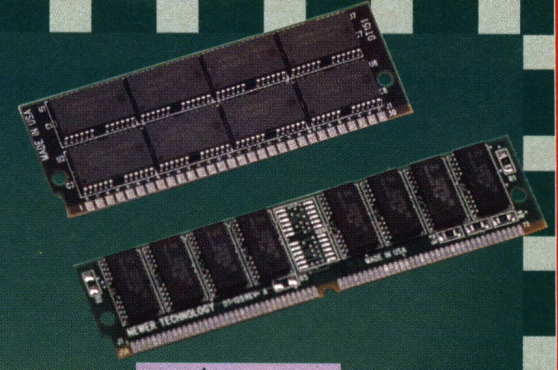

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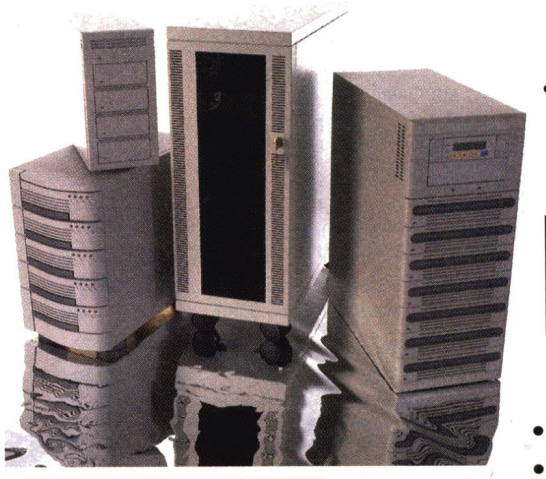

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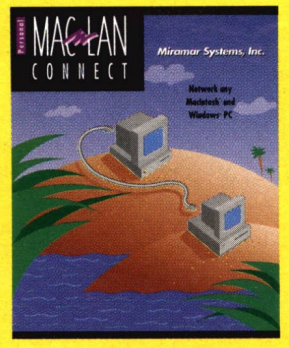

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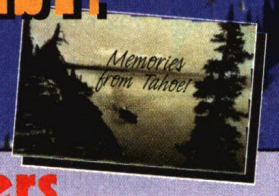

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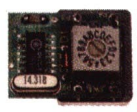

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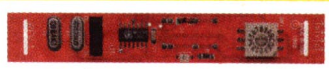

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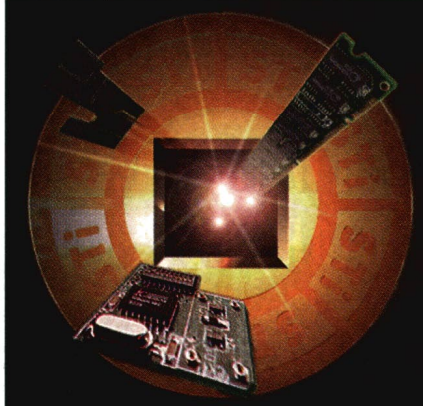

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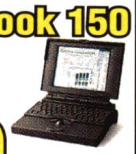

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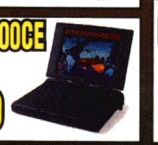

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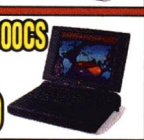

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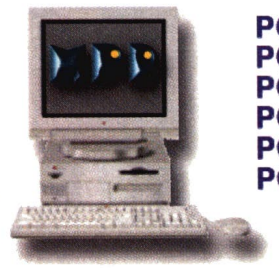

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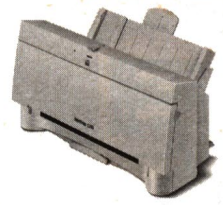

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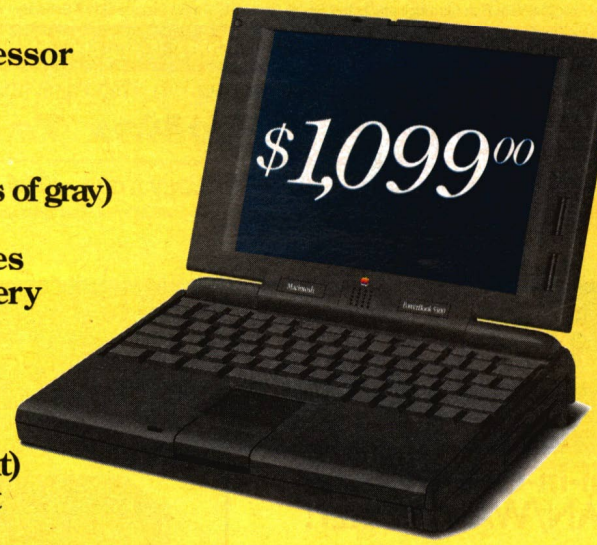

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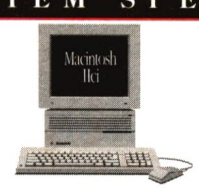

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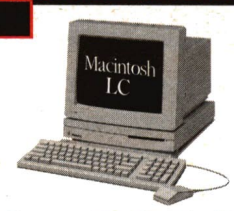

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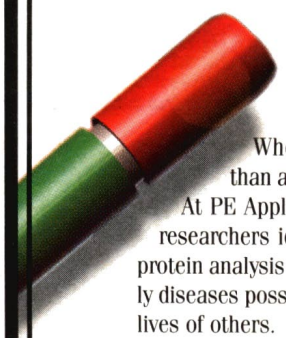

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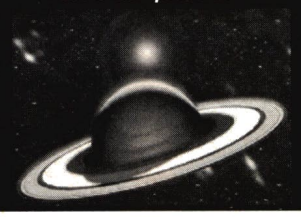

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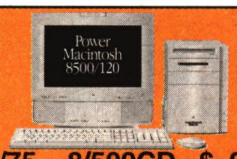

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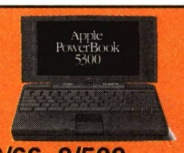

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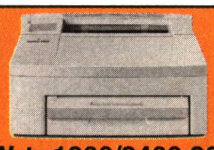

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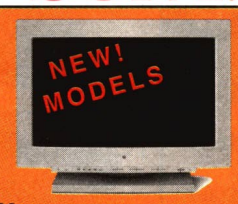

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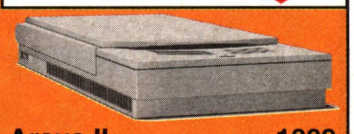

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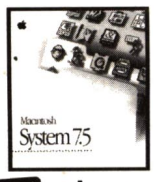

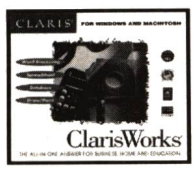

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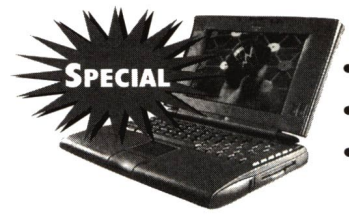

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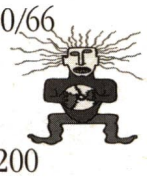

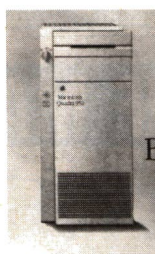

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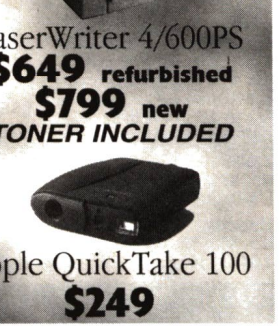

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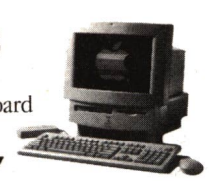

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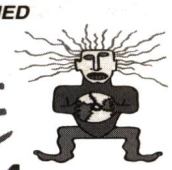

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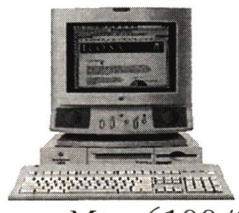

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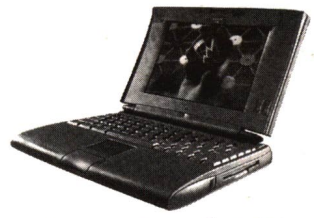

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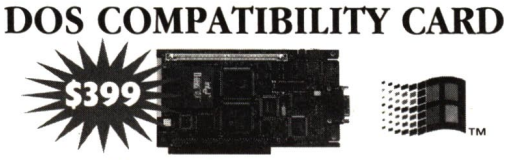

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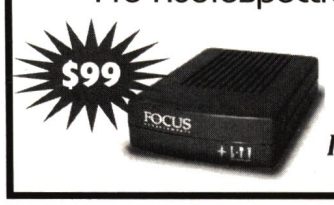

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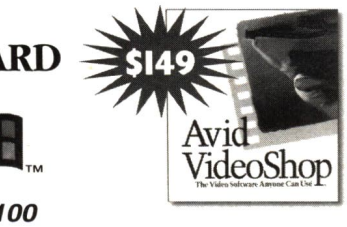

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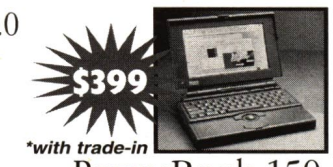

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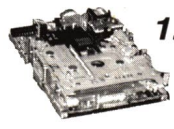

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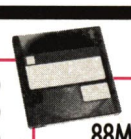

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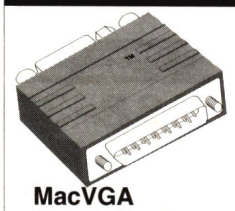

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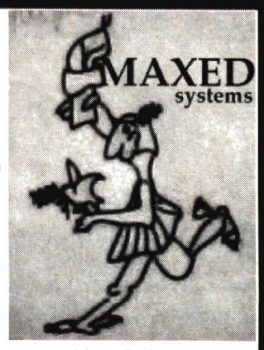

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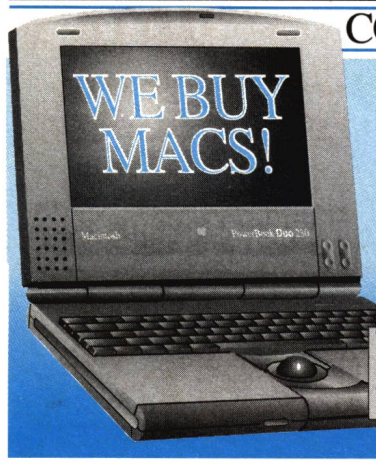

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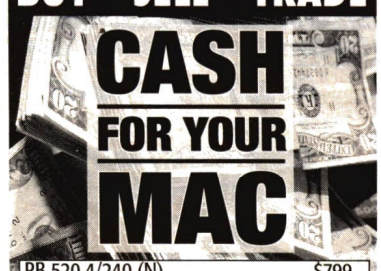

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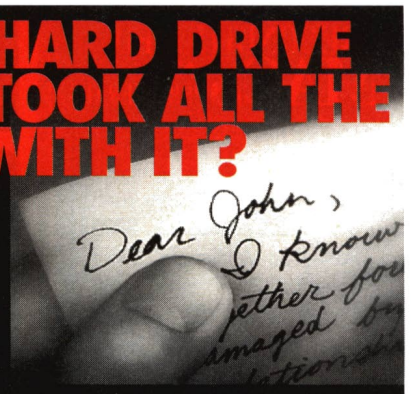

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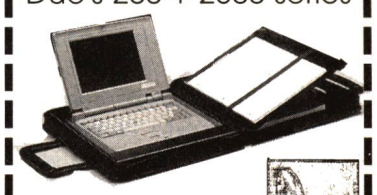

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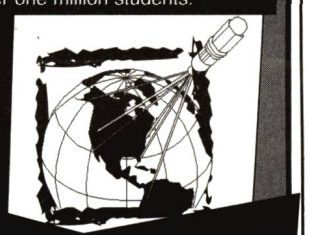

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Classified

Java

From Page 1

ics Inc., Novell Inc., Hewlett-Packard Co., Tandem Computers Inc. and Hitachi Ltd., as well as the SunSoft division of Sun Microsystems. According to Sun's JavaSoft division, the standard license for all these companies covers Java class libraries and the Java Virtual Machine (VM), a runtime interpreter needed to execute Java code on the given platform. The contracts also require licensees to add future Java APIs into their implementations in a timely fashion.

Apple Vice President of Internet Technologies Larry Tesler said the VM and Java classes will be in the Mac OS System folder soon. Apple will initially rely on one of its third-party developers to supply the VM but will replace it with an Apple-built version.

The Java programming language runs on any OS for which a VM exists, but there's a performance penalty. The VM must interpret Java code into native calls for the given processor, so Java applets run slower than standard applications, which usually contain precompiled code. To counter this drawback, several companies are building just-in-time (JIT) compilers that convert Java into native code as an applet is read, significantly enhancing Java's performance.

Tesler said that, like Microsoft's promised Java integration with Windows, Apple will provide a JIT in the Mac OS. The company has not decided if it will use a third-party JIT or create its own. "We know compilers," he said. "That's something we're really good at."

The Mac OS is not the only one that will gain Java; OpenDoc and the Newton OS are also included in Apple's license.

Tesler said an OpenDoc part that runs Java applets is already in development, and that Apple is looking at ways to expose the OpenDoc APIs to Java, letting applets access all parts of the OpenDoc architecture. "For instance, a Java applet could negotiate for window space in an OpenDoc document," he said. "That doesn't happen today."

Apple Internet Client Product Manager Glenn Fisher said, "The real story is around Java and OpenDoc." He also said Cyberdog, Apple's suite of OpenDoc parts for Internet connectivity, will gain Java functionality.

The initial release of Cyberdog is expected this month, but Tesler said he doubted Java would make the first release. "It would be a miracle if that happened," he said.

Tesler said development work to add Java to the Newton OS will have to start from scratch; no Java tools or code for Apple's PDA platform have been released.

Apple's Java license also extends to Pippin, the game player and Internet platform licensed to Bandai Co. Ltd. The Tokyo-based company licensed Sun's HotJava browser technology in February.

Jeff Morgan, president of Internet graphics vendor RadMedia Inc. of Palo Alto, Calif., was enthusiastic about Apple's license. "That means Java is on-board; now we don't have to worry about the technology being present on the user's machine," he said.

Robert Seidl, product manager for PageMill at Adobe Systems Inc. of Mountain View, Calif., said Java could have a significant impact on Adobe's development strategy. "Right now we have two development teams for each product, Mac and Windows. If we could build our applications once in Java and be done, it would be fantastic."

But Seidl said this prospect was far off. "Java currently comes with basic libraries — draw a line, draw a circle — not the kind of controls needed for complex image editing or [video]. Those will come in time."

Peter Coppola, senior project manager for NetManage Inc., a networking and communications vendor in Cupertino, Calif., said, "The problem we all now have is: How can you fully exploit Java's capabilities beyond a Java-enabled browser?" □

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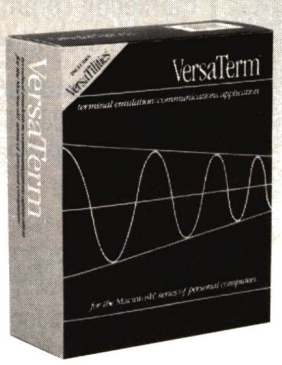

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ScanView

From Page 1

its straight optical path that the company said eliminates the need for mirrors.

The scanner's built-in LightView light table lets users examine slides and reflective originals while they are on the flatbed's platen. The scanner accommodates transparencies and prints measuring up to 8 by 17 inches and 11 by 17 inches, respectively.

According to ScanView, the device can capture a 4,000-dpi, 2.5-square-inch image in about four minutes or an 800-dpi, 4-by-5-inch original in about two minutes.

The ScanMate F8 connects to the Macintosh via a SCSI-2 interface. It will ship with ColorTrio, ScanView's own scanning software, which comprises an Adobe Photoshop-compatible plug-in as well as a stand-alone version.

In addition, users will be able to purchase ColorQuartet 3.4, ScanView's scanning and separation software, which lets users calibrate scanners and film recorders. A $1,100 RGB version includes closed-loop calibration, while a $1,950 version adds CMYK capabilities. For an additional $1,950, users will be able to purchase scanning-automation software for ColorQuartet.

ScanView said it is aiming for the same graphics professionals who purchased Hauppauge, N.Y.-based Linotype's $49,000 Topaz flatbed scanner. The Topaz offers a color depth of 48 bits and an optical resolution of 3,800 dpi, which can be interpolated up to 8,150 dpi via software. It scans transparencies measuring up to 8 by 18 inches and reflective originals up to 12 by 18 inches.

Analyst Kristy Holch, principal of InfoTrends Research Group Inc. of Plymouth, Mass., said, "Topaz is the scanner that's been stealing all the talk; it's just going gangbusters."

Holch said Linotype's success is spurring on a new generation of high-end flatbed devices from graphics hardware heavyweights, starting with ScanView. "ScanView is known for innovating along the lines of price/performance," Holch said. "They try to bring the performance of the high end down to lower cost by eliminating some bells and whistles while trying to maintain image quality."

Holch predicted that Agfa, a division of Bayer Corp. of Ridgefield Park, N.J., and Scitex America Corp. of Bedford, Mass., will soon join Linotype and ScanView with top-of-the-line flatbeds.

According to Holch, the ScanMate F8 and other flatbeds in its class are the result of improvements to CCD technology that bring it up to par with more expensive photomultiplier tube (PMT)-based drum scanners. "The argument has always been CCDs just aren't good enough," she said. "But each year that goes by, the technology on CCDs has been improving. Nowadays, the general consensus is that CCDs can provide as much quality as PMTs at this level."

Flatbed scanners for graphics professionals comprised a "kind of a tapped-out market in the past," Holch said. "But now that the prices have come down, it's at the level where service bureaus can justify buying one."

ScanView Inc. of Foster City, Calif., is at (415) 378-6360; fax (415) 378-6368. □

UMAX

From Page 1

a RAM capacity of 1 Gbyte, as well as an 8x CD-ROM drive. A similarly configured Power Mac 9500/150 with a quadruple-speed CD-ROM costs about $4,800.

UMAX will also offer the SuperMac S900D, a $3,095 model without a hard drive or display card. In addition, the company said it expects to ship a pair of models later this summer: a $2,500 midrange system code-named RipTide and a $1,500 entry-level model.

Andy Chang, senior vice president at UMAX, said its Mac clones will leverage other UMAX subsidiaries, such as Taipei, Taiwan-based MiRA Technology Inc. and PowerChip Semiconductor Corp. for CD-ROM drives and memory, respectively. It will also take advantage of its Fremont, Calif.-based Nextrend Technology Inc. for assembly and NewSoft Inc. for software development.

UMAX's corporate parent, UMAX Data Systems Inc. of Taipei, announced plans in November to build Mac clones for Chinese buyers (see 11.27.95, Page 108). In January, UMAX purchased Sunnyvale, Calif.-based Radius Inc.'s PCI Mac designs and created a U.S. computer division (see 01.15.96, Page 1).

"We felt we could do better than just Taiwan," Chang said. The company will produce the Mac logic boards in Taiwan, where its corporate sibling, Elite Computer Systems, is a large manufacturer of Intel-standard PC boards for OEMs.

According to UMAX, its vertical integration will help the computer operation avoid the financial problems experienced by other vendors in the Mac clone market, such as Radius and DayStar Digital Inc.

Unlike Power Computing Corp.'s direct-marketing operation, UMAX said it will enter the dealer channel via Ingram Micro Inc. of Santa Ana, Calif., and second-tier distributors. Comparing Apple, Power and itself to PC market players IBM Corp., Dell Computer Corp. and Compaq Computer Corp., respectively, UMAX said it will offer resellers higher margins to help sales.

"Apple and Power have soured the channel, and anything [UMAX offers] will be better," Chang said. Recent PC-market price wars have also hurt the channel, he said, and UMAX aims to recruit up to 500 resellers by the end of the year. "We will offer a more traditional PC margin, and we can do well on less," he said.

Chang said the company expects to sell about 100,000 clones by the end of the year. He said UMAX will also sell a line of branded monitors from several OEM manufacturers.

Analysts were optimistic about UMAX's plans. "It's definitely not a screwdriver clone operation," said Pieter Hartsook, editor of The Hartsook Letter in Alameda, Calif. "They're providing engineering innovation to the Mac platform."

While based on Apple's 9500, the S900 models have several changes aimed at boosting performance and reliability for digital video and server applications, UMAX said.

Instead of the 9500's pair of PCI controllers, the S900 runs a single controller and a PCI-to-PCI chip. UMAX said this improves data transfer performance between cards by eliminating the need to dip in and out of main memory.

The S900 also uses a different scheme for multiprocessing. Instead of providing a single slot for a card with several processors, the S900 offers a pair of slots for upgrades. The $995 second processor card will depend on the primary card's clock chip and cannot be used in other Macs.

UMAX said the S900 will support faster PowerPC chips running at up to 250 MHz. The current speed leaders are Power's recently released PowerTower models with 166- and 180-MHz chips.

Another change from Apple's design is a small extension for one of the PCI slots. While the proprietary slot can be used with standard cards, it also supports a card with a longer connector that fits over both plugs. UMAX will offer a $495 combination card with Fast Ethernet and Wide Ultra SCSI-3 developed with Asanté Technologies Inc. and FWB Inc., whose utilities will be bundled with the models.

Like PC clone vendors, UMAX said it will contract out its technical support. The "channel friendly" support will not be exclusive and will let resellers cover customers in their geographic area.

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Dantz

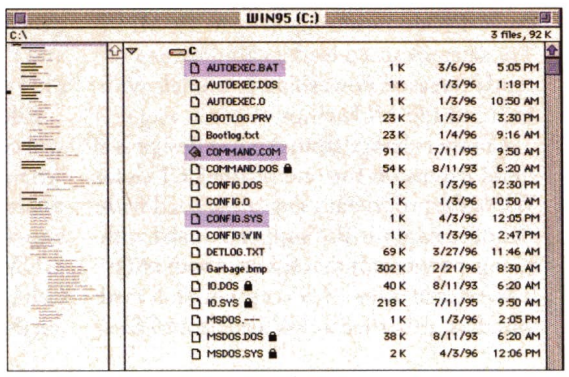
From Page 1

now provides Mac users. Any Mac running Open Transport 1.1 and a new Retrospect release, Version 3.0A, can function as a backup server for Windows machines.

The release will come nearly 18 months after Dantz, based in Orinda, Calif., first announced plans to move into the PC market with Remote 10-Pack for NetWare, which the company shelved during the development process (see story, right).

Setting up backups for a PC with Remote Pack will be as easy as it is for a Mac, sources said. Existing Retrospect scripts and selectors, or file filters, will work without modification. Retrospect 3.0's popular Backup Server feature, which provides automatic backup for mobile systems as soon as they are connected to the network, will also work with PC laptops.

Dantz will use TCP/IP, which is built into Windows 95 and NT, to communicate between PC clients and the Mac backup server; the Windows machines can be connected to NetWare servers at the same time via IPX. With a Power Mac 8500/132 running Retrospect, sources said backup speeds will range from about 15 Mbytes per minute from a 486 DX2/66 to 25 Mbytes per minute from a 100-MHz Pentium system. For Mac-to-Mac backups Retrospect 3.0A will continue to rely on AppleTalk, which limits throughput to a maximum of about 10 Mbytes per minute.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Users will be able to negotiate PC directories for backups just as they can with Mac varieties with Dantz's forthcoming Remote Pack for Windows 95/NT.

Because it depends on a Mac server, the new Remote Pack does not support file names with more than the 31 characters the Mac OS permits, sources said. When it encounters a file that takes advantage of Windows 95's and NT's limit of up to 256 characters, Retrospect will instead use the unique "8.3" file name that the Microsoft operating systems use internally to identify such files. If a user, who is requesting a copy of such a file from a backup, knows only the long name, the administrator will have to search Retrospect's log to find its 8.3 name. Dantz reportedly plans to add full support for long file names in a future version of Retrospect.

Sources said the company is expected to market five-, 10- and 50-user Remote Packs, including an installer that updates Retrospect 3.0 to 3.0A, at street prices of about $120, $200 and $700, respectively. Retrospect itself carries a list price of $249; Retrospect Remote, including the application plus support for 10 networked Macs, lists for $449.

Dantz declined to comment. □

Why Dantz dropped SMS

The upcoming Remote Pack for Windows 95/NT will be Dantz Development Corp.'s first cross-platform product, but not for want of trying. Nearly a year and a half ago Dantz announced a different plan to provide backup services to Intel-standard PC clients. At that point the company planned to ship a product called Remote 10-Pack for NetWare in April 1995.

But that effort was hampered by technical problems, and Dantz reportedly abandoned it before the software ever reached the beta stage. The problem was that it relied entirely on technology from Provo, Utah-based Novell Inc. — an architecture called Storage Management System (SMS) and an associated data-passing scheme called Target Service Agent — as an interface between Retrospect on the Mac and NetWare clients and servers. In fact, Dantz said at the time that it would not need to install any of its own software on NetWare clients.

Unfortunately, Dantz engineers were never able to get the Novell technology to work reliably with Retrospect. Eventually, sources said, Dantz executives decided to move to a new plan, under which they would develop their own Windows client and data transfer scheme.

"If it was so hard, why are other companies doing it?" asked a developer familiar with SMS. Several companies use SMS, including Palo Alto, Calif.-based Legato Systems Inc., which uses it in its NetWorker network backup system.

Dantz's software is now slated to ship Remote Pack for Windows 95/NT in June. — *By Henry Norr*

Laptops

From Page 1

nectors. Apple may bundle a PCI card with a modem and Ethernet.

Hooper's PC Card slot will support Zoom Video (ZV), a port now appearing in some Intel-standard PC laptops, sources said. The ZV port speeds MPEG video playback and can display video at 30 frames per second in a 320-by-240-pixel window.

Hooper's 5-inch expansion bay, designed to accept a CD-ROM drive, will also be compatible with 3.5-inch storage devices designed for the 5300 series; sources said Epic will not accept 5300 accessories.

Both machines will reportedly ship with either active-matrix or dual-scan color screens; gray-scale LCD screens will not be available.

Sources familiar with the two machines were enthusiastic about Hooper. "Hooper looks like a winner," said one.

"I think it will be extraordinarily successful. ... Hooper is going to be my computer of choice," another source said; a third source agreed: "I think we potentially have a real screamer on our hands."

Apple declined to comment. □

Apple's PowerBook plans evolve

	EPIC	HOOPER
Date	October (was July)	October
Price	$2,000-$3,500	$4,500-$6,500
Processor	117-MHz 603e	180- or 200-MHz 603e
Notable features	CD-ROM, upgradable CPU	PCI, lithium-ion, CD-ROM
Accepts 5300 accessories?	No	Yes

IBM Japan has designs on PPCP notebooks

Behind closed doors, IBM Corp. is reportedly planning to bring the Mac OS to its portable line.

In the second half of the year, IBM of Armonk, N.Y., will release a reference design for portables based on the PowerPC Platform, sources said.

Instead of marketing a PowerPC portable under its ThinkPad brand name, IBM will use its manufacturing facility in Japan to produce motherboards and complete notebooks, sources said.

"The concept is to build a fast, workable solution that sells chips for IBM," a source familiar with the plans said.

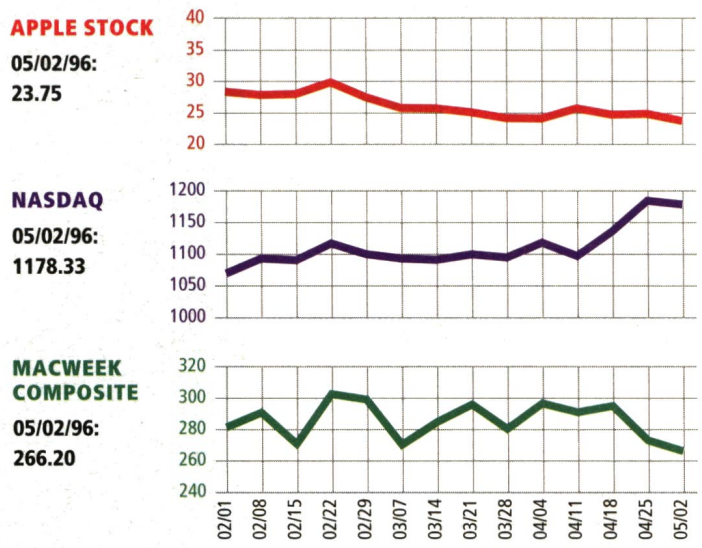
"IBM [Personal Computer Co.] has made a conscious decision to market only x86 [systems]," another source said.

Though IBM will primarily target Japanese and Taiwanese personal computer makers, PowerPC portables from those vendors are likely to show up in the United States through OEM agreements, sources said.

According to Jesse Parker, director of segment marketing for IBM Microelectronics division, who works in Waltham, Mass., several Taiwanese vendors will unveil their PowerPC plans within 90 days.

In addition, IBM will disclose reference designs for an entry-level and a high-end desktop as well as a dual-processor-capable PC server, Parker said. — *By Lisa DiCarlo, PC Week staff*

StockWatch



	05.02.96 CLOSE	WEEKLY CHANGE
Apple	23.75	-1.13
MacWEEK Composite*	266.20	-6.88
SOFTWARE DEVELOPERS		
Adobe	41.38	-1.63
Caere	9.63	0.00
CE Software	2.50	-0.13
Fractal	12.50	-1.25
Graphsoft	5.63	-0.38
Insignia	7.88	1.63
Intuit	51.00	2.75
Macromedia	37.00	-1.50
Microsoft	111.63	-1.13
Novell	13.88	0.50
Oracle	32.88	-1.50
Symantec	15.50	-1.13
STORAGE		
Conner	25.75	0.00
Iomega	57.38	6.88
Pinnacle	10.25	0.13
Quantum	22.38	1.00
Seagate	58.63	2.00
SyQuest	5.94	-0.63

	05.02.96 CLOSE	WEEKLY CHANGE
PERIPHERALS VENDORS		
AmeriQuest	0.81	-0.06
Asanté	6.50	0.38
Focus	2.94	0.31
Global Village	17.25	-0.88
HP	104.25	-5.75
QMS	6.25	0.50
Radius	3.75	0.94
Shiva	58.25	-5.50
Tektronix	39.50	-0.13
Truevision	9.25	0.44
DISTRIBUTORS		
CompUSA	34.75	-0.75
IE	8.75	2.00
Merisel	3.69	-0.06
Tech Data	19.50	0.88
INDUSTRY INDICATORS		
Compaq	46.63	-0.38
IBM	107.88	-0.50
Intel	68.00	-1.63
Motorola	60.63	-3.38
SGI	29.13	0.38
NASDAQ	1178.33	-5.84

**The MacWEEK Composite is calculated by adding the stock prices of the following companies: Apple, Adobe, Asanté, Caere, CE Software, Global Village, Intuit, Macromedia, Radius, Shiva, SyQuest and Truevision. Source: Nordby International Inc.*

Loma Prieta

From Page 1

dows 3.1, Windows 95 and Windows NT systems.

Loma Prieta will reportedly have an interface and basic feature set similar to PageMill. Like Adobe's program, Loma Prieta will have separate editing and display modes and will launch a browser for more-accurate previews of pages. It will also offer a drag-and-drop library for storing frequently used images and will support such standard Web-page design items as paragraph alignment, links, images, rules, background colors and textures, colored text, and lists.

Sources said that designers will be able to add transparency, URLs (uniform resource locators) and image-map coordinates to graphics.

What will reportedly set Loma Prieta apart from Adobe's product is a group of features not currently found in PageMill: viewing and editing of HTML code, table creation, support for HTML frames, and the capability to embed Java applets and any content that requires a Netscape Navigator plug-in.

The program will also give Web-page authors estimates of the time it will take to download a completed page with either a 14.4-Kbps or 28.8-Kbps modem.

Sources said Loma Prieta will be able to meet the needs of those who create Web pages on a Mac but publish via a Windows or Unix server. For example, the program will let users save documents to a remote Web server and will create line breaks specific to the given platform.

The program will also be able to use relative or absolute links for images and files associated with a page. Relative path names are required when Web pages will be served from a remote server.

One source called Loma Prieta "extremely robust" but said it will face stiff competition by the time it reaches the market, mainly from PageMill 2.0 — which is due to ship this summer with some of Loma Prieta's advanced features — and Netscape Communications Corp.'s Navigator Gold (see story, Page 16).

San Andreas Systems, which is reportedly seeking a buyer for Loma Prieta, has been making the rounds of several prominent companies and may announce a deal as soon as next month; therefore, the company has not set the product ship date, according to sources.

San Andreas Systems declined to comment. □

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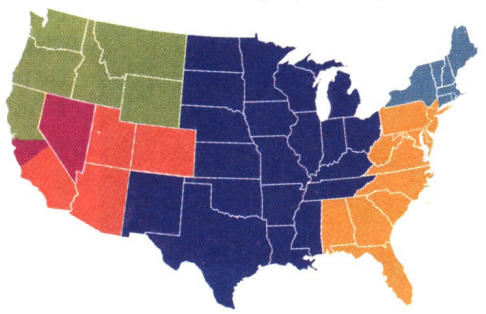

[1] Includes New Brunswick, Newfoundland, Prince Edward Island, Quebec, Manitoba and Ontario, Canada

[2] Includes Northern California north of San Mateo; Alaska; and Alberta and British Columbia, Canada

[3] Includes San Francisco Bay Area south of the San Mateo Bridge to San Luis Obispo

[4] Includes Southern California south of San Luis Obispo, Arizona, Utah and Colorado

[5] Includes New York metropolitan area

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Online this week

ZDNet Plug-in madness

Keep up to date with the latest Netscape Navigator/Microsoft Explorer plug-ins. MacWEEK's plug-in page continues to grow with RapidTransit for sound and WebActive for 3-D clip art (http://www.zdnet.com/macweek/plugins.html).

Amelio speaks

In this week's "Off the Record" column, Mark Hall discusses Apple CEO Gilbert Amelio's plans to "align the company." Get the details online at: (http://www.zdnet.com/macweek/mw_1018/opinion_otr.html).

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Bus kept a-rollin' all night long

In light of recent developments in Montana, the Knife has begun to worry that he may be spending too much time enjoying his own company. While he likes nothing better than locking himself in his rustic shack (located in the heart of San Francisco's financial district) and typing maniacally on a treadle-operated PowerBook 5300 while ignoring personal hygiene for weeks at a time, the Knife sometimes wonders what he might be missing out in the big, bright, beautiful world.

Recalling Paul's grandfather's admonition to Ringo in "A Hard Day's Night," the Knife took it upon himself to go parading. Bus ticket in hand, your humble narrator last week headed off on a whirlwind Western tour of some of the computer industry's current flash points.

¿Dónde están los clones?

First stop on the Knife's voyage of personal discovery was the sleepy pueblo of Fremont, Calif., the far-flung U.S. outpost of Taiwanese behemoth UMAX. Munching thoughtfully on the crustless cucumber sandwiches he had carefully wrapped in wax paper for the long journey ahead, the Knife pressed his ear to the cool adobe wall of UMAX's hacienda.

Soon he was rewarded with the information he sought: glad tidings of the company's entry into the consumer end of the Mac clone business. Some of the details were apparently muffled by layers of drywall and fiberglass insulation, but the Knife was able to glean that UMAX is planning a $1,500 Mac-in-the-box due to hit the mean streets in August. While the UMAX clone will be based on the Performa 5400 and will come with a monitor, the sound of flushing pipes prevented the Knife from determining whether the new machine will be an all-in-one model.

From the halls of Cupertino ...

Drawing on his SEAL-team training (instilled by an overachieving scoutmaster when he was but knee-high to a Webelo), the Knife next forded San Francisco Bay to reach Apple's campus. Wedging his substantial frame behind some suspiciously fibrous ceiling tiles, he found himself privy to an interesting discussion of OpenDoc's August coming-out party at Macworld Boston.

Seems the component-software architecture will gain some hard-core hangers-on at the show: some 40-odd parts editors and containers. One phantom limb among the OpenDoc parts will be Athena Design's Mesa spreadsheet. The buzz is that Apple cut promised funding for the port from OS/2 because of a surfeit of developers.

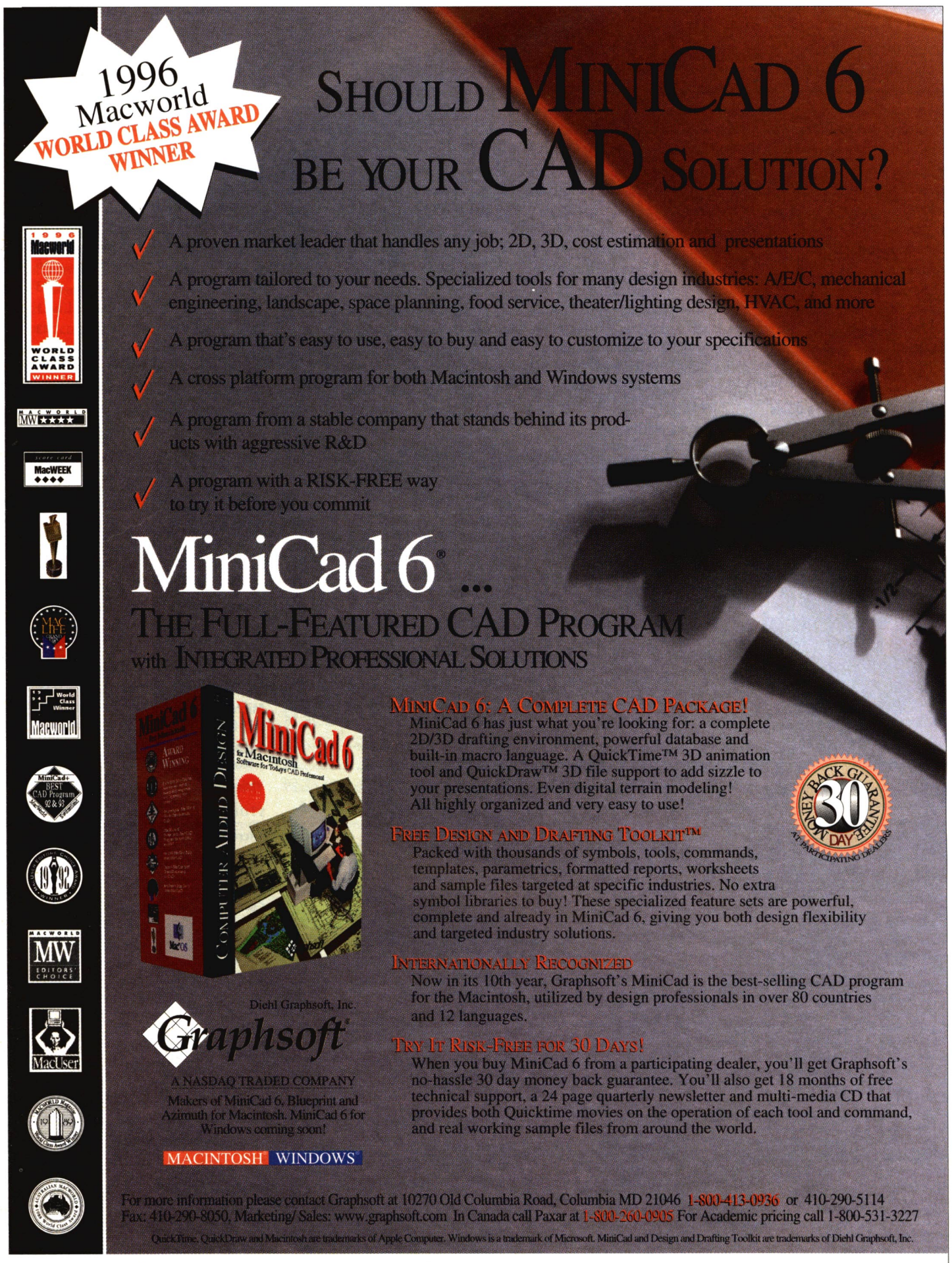
... to the rafters of City Center 4

After crawling crablike through a bewildering array of vents, the Knife found himself crouched behind a water cooler, listening to angry remonstrations from the Apple sales team. Seems Apple had lost out on a 2,000-desktop sale to Hawthorne, Calif., defense contractor Northrop Corp. To add insult to injury, the winner in this particular bidding war wasn't some faceless purveyor of Windows-based gratification but Apple's own faithless protégé, Mac cloner Power Computing.

Rocky Mountain high

Depressed by the conflict he had witnessed and anxious for a happy word from some corner of the Apple empire, the Knife spent some 36 hours in a succession of smoke-cured Greyhound stations to reach the rarefied heights of the company's soon-to-be-ex-Fountain, Colo., plant. Alas, his ingress was blocked by 50 former employees heading for the unemployment line. Rumor has it that the 1,100 employees remaining inside the building are facing pay cuts of 10 percent to 15 percent, courtesy of new owner SCI. □

There's no place like home, especially when you've got a swank MacWEEK mug on the mantel. Tip the Knife at (415) 243-3544; fax (415) 243-3651; mac_the_knife@macweek.com.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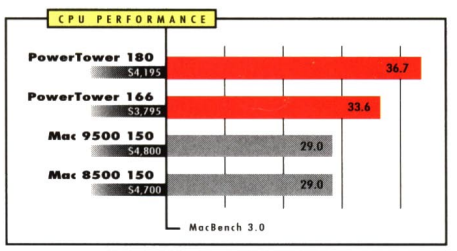

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- 512K Level 2 Cache
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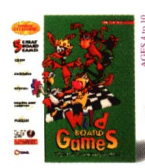

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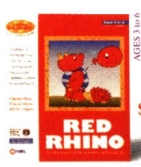

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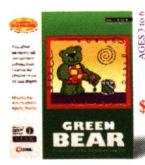

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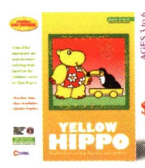

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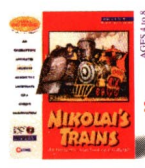

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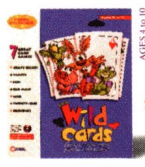

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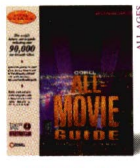

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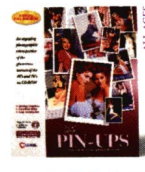

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